Vol. 909 Number 1

OFFICIAL GAZETTE

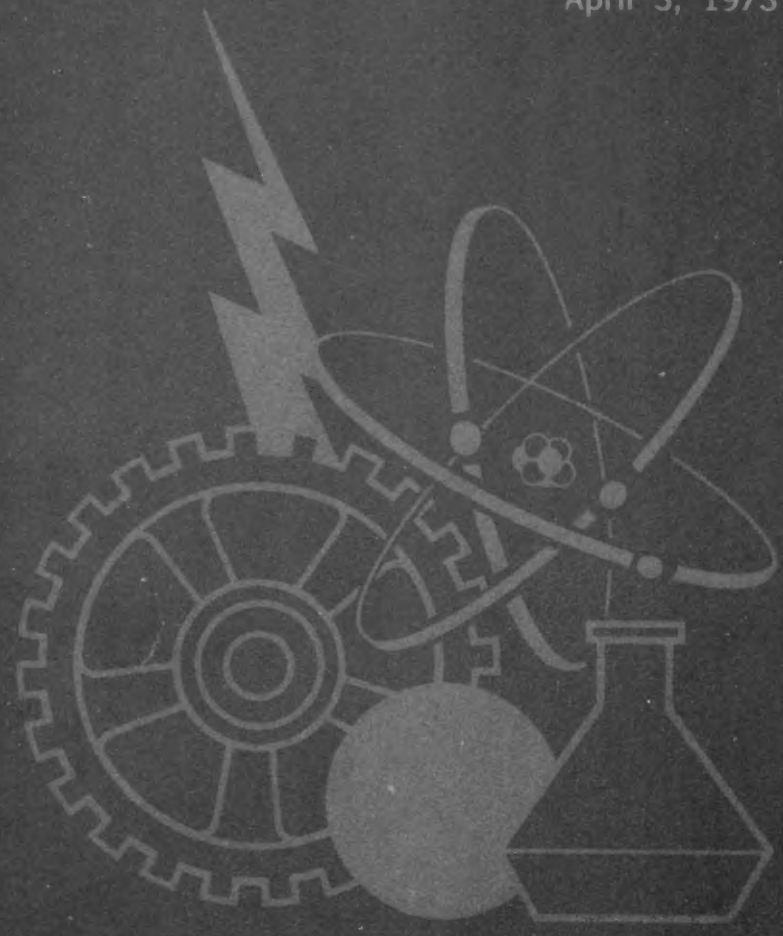
of the

UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

April 3, 1973



U. S. DEPARTMENT OF COMMERCE

Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

April 3, 1973 Volume 909 Number 1

CONTENTS

Page

Patents and Trademark Notices
- Board of Appeals Decisions Rendered in the Month of February 1973 . . 2
- Registration to Practice 2
- Patent Suits 2

Patent Notices
- Certificates of Correction for the Week of April 3, 1973 3
- Patents Available for Licensing or Sale 3

Condition of Patent Applications 4

Defensive Publications 5

Reissue Patents Granted 9

Patents Granted
- General and Mechanical 12
- Chemical 262
- Electrical 364

Design Patents Granted 467

Index of Patentees . . . . . PI 1

Indices of Applicants of Defensive Publications, Reissues, and Designs . . . PI 59

Classification of
- Patents (Including Reissues) . . . . . PI 61
- Design and Defensive Publications . . . . . PI 64

Geographical Index of Residence of Inventors
- Patents (Including Reissues) . . . . . PI 65
- Designs and Applicants of Defensive Publications . . . . . PI 67

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of February 1973

Examiner affirmed	134
Examiner affirmed in part	16
Examiner reversed	29
Total	179

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office on the basis of 4 years or more service in the Examining Corps. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds should be furnished the Commissioner of Patents on or before April 27, 1973.

Michael, Edward J., 213 Sheridan St. NW., Washington, D.C. 20011

Moxon, George W. II, 1449A N. Van Dorn St., Alexandria, Va. 22304

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,544,246, G. H. Butterfield, CORNEAL CONTACT LENS, filed Sept. 2, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c1812, *George H. Butterfield, Sr.* v. *Oculus Contact Lens Company, Inc.* **Same, filed** Oct. 22, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c2184, *George H. Butterfield, Sr.* v. *Contact Lens Service, Inc.* **Same,** Doc. 69c2186, *George H. Butterfield, Sr.* v. *Custom Contact Lens Laboratories, Inc.* **Same, filed** Feb. 20, 1970, same, Doc. 70c412, *George H. Butterfield, Sr.* v. *Vogel Contact Lens Company.* **Same,** Doc. 70c414, *George H. Butterfield, Sr.* v. *Halcon, Inc.* **Same,** Doc. 70c415, *George H. Butterfield, Sr.* v. *B & M Optical Company.* **Same,** Doc. 70c416, *George H. Butterfield, Sr.* v. *The House of Vision, Inc.* **Same, filed** Dec. 22, 1969, D. C., W.D. Ky. (Louisville), Doc. 6376, Transferred to Northern District of Illinois on Feb. 12, 1970, Case 70c324, *George H. Butterfield, Sr.* v. *SCL Laboratories & Southern Optical Co.* **Same, filed** Oct. 28, 1969, Nebr. (Omaha), Doc. 03404, transferred to Northern District of Illinois, Doc. 70c329, *George H. Butterfield, Sr.* v. *Rite Style Optical Co., Inc.* **Same, filed** Sept. 12, 1969, D.C., N.D. Ga. (Atlanta), Doc. 13009, transferred to Northern District of Illinois (Chicago), Doc. 70c330, *George H. Butterfield, Sr.* v. *Quality Optics, Inc.* **Same, filed** Oct. 15, 1969, D.C., E.D. La. (New Orleans), Doc. 69–2346, transferred to Northern District of Illinois (Chicago), Doc. 70c339, *George H. Butterfield, Sr.* v. *Custom Contact Lens Lab.* **Same, filed** Oct. 24, 1969, D.C., W.D. Tex. (Waco), Doc. W69–CA–48, transferred to Northern District of Illinois (Chicago), Doc. 70c397, *George H. Butterfield, Sr.* v. *Contour Comfort Contact Lens, Inc.* **Same, filed** Feb. 11, 1970, D.C., District of Kansas, Doc. W–4315, transferred to Northern District of Illinois, Doc. 70c856, *George H. Butterfield, Sr.* v. *Dr. Doyle O. Burch, etc.* **Same, filed** Feb. 13, 1970, D.C. Mo. (Kansas City), Doc. 18100–4, transferred to Northern District of Illinois (Chicago), Doc. 70c857, *George H. Butterfield, Sr.* v. *B & R Enterprises, Inc. Central Labs.* **Same, filed** Feb. 17, 1970, D.C., W.D. Mich. (Detroit), Doc. 6274, transferred to Northern District of Illinois (Chicago), Doc. 70c858, *George H. Butterfield, Sr.* v. *Art Optical Contact Lens Div.* **Same, filed** Feb. 12, 1970, D.C., E.D. La. (New Orleans), Doc. 70–308, transferred to Northern District of Illinois, Doc. 70c859, *George H. Butterfield, Sr.* v. *Accurate Contact Lens Lab.* **Same, filed** Feb. 11, 1970, D.C., E.D. La. (New Orleans), Doc. 70–302, transferred to Northern District of Illinois (Chicago), Doc. 70c860, *George H. Butterfield, Sr.* v. *Gulf Coast Contact Lens, Inc.* **Same, filed** Feb. 25, 1970, D.C., N.D.N.Y., Doc. 70–CV–58, transferred to Northern District of Illinois (Chicago), Doc. 70c863, *George H. Butterfield, Sr.* v. *Onondaga Optical Co.* **Same, filed** Feb. 13, 1970, D.C., W.D. Tenn., Doc. 1963, transferred to Northern District of Illinois (Chicago), Doc. 70c864, *George H. Butterfield, Sr.* v. *Mullers Contact Lens Service, Inc.* **Same, filed** Feb. 24, 1970, D.C., N.D. Ohio (Cleveland), Doc. C–70–170, transferred to Northern District of Illinois (Chicago), Doc. 70c866, *George H. Butterfield, Sr.* v. *Reese Optical Co., Inc. and Bausch & Lomb Inc.* **Same, filed** Feb. 11, 1970, D.C., N.D. Ohio (Cleveland), Doc. C–70–128, transferred to Northern District of Illinois (Chicago), Doc. 70c867, *George H. Butterfield, Sr.* v. *Fred Rump Contact Lens Lab.* **Same, filed** Mar. 3, 1970, D.C., E.D. Wis., Doc. 70–C–119, transferred to Northern District of Illinois (Chicago), Doc. 10c868, *George H. Butterfield, Sr.* v. *Ray-Con Inc.* **Same, filed** Feb. 24, 1970, D.C., E.D. Wis., Doc. 70–C–101, transferred to Northern District of Illinois (Chicago), Doc. 70c870, *George H. Butterfield, Sr.* v. *Wisconsin Optical Service Inc.* **Same, filed** Feb. 12, 1970, D.C., District of Arizona, Doc. C–70–90 PHX, transferred to Northern District of Illinois (Chicago), Doc. 70c871, *George H. Butterfield, Sr.* v. *Guarantee Contact Lenses of Arizona.* **Same, filed** Feb. 17, 1970, D.C., S.D. Ohio (Columbus), Doc. 70–39, transferred to Northern District of Illinois (Chicago), Doc. 70c887, *George H. Butterfield, Sr.* v. *White-Haines Optical Co.* **Same, filed** Feb. 20, 1970, D.C., W.D.N.Y., Doc. C–1970–88, transferred to Northern District of Illinois (Chicago), Doc. 70c922, *George H. Butterfield, Sr.* v. *Gordon Contact Lenses, Inc.* **Same, filed** Feb. 27, 1970, D.C., District of Colorado, Doc. C–2110, transferred to Northern District of Illinois (Chicago), Doc. 70c928, *George H. Butterfield, Sr.* v. *Bell Optical Lab.* **Same, filed** Mar. 11, 1970, D.C., S.D. Tex. (Houston), Doc. 70–H–224, transferred to Northern District of Illinois (Chicago), Doc. 70c942, *George H. Butterfield, Sr.* v. *Contact Lens Lab. Inc.* **Same, filed** Mar. 9, 1970, D.C., E.D. Mo. (St. Louis), Doc. 70–C–105, transferred to Northern District of Illinois (Chicago), Doc. 70c966, *George H. Butterfield, Sr.* v. *Alvin Contact Lens Corp.* **Same, filed** Feb. 11, 1970, D.C., W.D. Tex. (El paso), Doc. EP 70–CA–22, transferred to Northern District of Illinois (Chicago), Doc. 70c994, *George H. Butterfield, Sr.* v. *Lone Star Contact Lens Labs, Inc.* **Same, filed** Mar. 25, 1970, D.C. E.D. Va. (Richmond), Doc. 173–70–R, transferred to Northern District of Illinois (Chicago), Doc. 70c1069, *George H. Butterfield, Sr.* v. *Corneal Lens Lab Inc.* **Same, filed** May 16, 1969, D.C., C.D. Calif. (Los Angeles), Doc. 69–958 FW, transferred to Northern District of Illinois (Chicago), Doc. 70c1072, *George H. Butterfield, Sr.* v. *Calcon Lab.* **Same, filed** Apr. 6, 1970, D.C., W.D. Tex. (El Paso), Doc. EP 70–CA–66, transferred to Northern District of Illinois (Chicago), Doc. 70c1230, *George H. Butterfield, Sr.* v. *Con-O-Lite, Inc.* **Same, filed** Apr. 24, 1970, D.C., E.D. Tenn., Doc. 2513, transferred to Northern District of Illinois (Chicago), Doc. 70c1231, *George H. Butterfield, Sr.* v. *Appalachian Optics, Inc.* **Same, filed** Apr. 13, 1970, D.C., N.D. Tex. (Amarillo), Doc. CA–2–847, transferred to Northern District of Illinois (Chicago), Doc. 70c1254, *George H. Butterfield, Sr.* v. *Opti-Lens, Co., Inc.* **Same, filed** Apr. 6, 1970, D.C., M.D. Fla. (Tampa), Doc. 70–130–C, transferred to Northern District of Illinois (Chicago), Doc. 70c1282, *George H. Butterfield, Sr.* v. *Obrio Lab., Inc.* **Same, filed** Apr. 15, 1970, D.C., W.D. Ill. (Rockford), Doc. 70–C–20, transferred to Northern District of Illinois (Chicago), Doc. 71c1289, *George H. Butterfield, Sr.* v. *Arlon Contact Lens Lab. Inc.* **Patent invalid, Oct. 26, 1971.**

Certificates of Correction for the Week of Apr. 3, 1973

D. 223,300	3,672,833	3,686,414	3,693,750
D. 224,409	3,673,052	3,686,556	3,693,787
3,006,468	3,673,223	3,686,761	3,693,792
3,388,305	3,673,435	3,686,767	3,693,941
3,426,916	3,674,763	3,686,987	3,694,016
3,532,332	3,675,465	3,687,031	3,694,428
3,562,307	3,677,091	3,687,042	3,694,754
3,562,308	3,677,722	3,687,123	3,694,873
3,576,661	3,677,828	3,687,174	3,695,071
3,580,946	3,677,869	3,687,250	3,695,219
3,603,807	3,678,261	3,687,255	3,695,546
3,610,968	3,678,276	3,687,551	3,695,554
3,613,484	3,678,376	3,687,557	3,695,669
3,615,027	3,678,563	3,687,790	3,695,863
3,634,062	3,680,147	3,687,845	3,695,885
3,635,342	3,680,349	3,687,893	3,695,999
3,635,918	3,680,411	3,687,943	3,696,053
3,637,678	3,681,184	3,688,876	3,696,155
3,642,693	3,681,611	3,689,371	3,696,169
3,642,730	3,682,130	3,689,551	3,697,102
3,642,821	3,682,298	3,689,560	3,697,246
3,643,302	3,682,443	3,689,874	3,697,424
3,647,696	3,682,867	3,690,498	3,697,518
3,647,841	3,684,018	3,690,607	3,697,699
3,647,855	3,684,340	3,690,688	3,697,702
3,651,962	3,684,358	3,690,813	3,698,197
3,652,281	3,684,523	3,690,887	3,700,307
3,652,341	3,684,567	3,690,905	3,700,507
3,655,334	3,684,580	3,690,920	3,700,709
3,655,729	3,684,642	3,691,030	3,701,091
3,657,451	3,684,735	3,691,437	3,701,815
3,659,026	3,684,780	3,691,939	3,701,856
3,659,752	3,685,193	3,692,175	3,702,076
3,662,307	3,685,414	3,692,342	3,702,154
3,664,118	3,685,519	3,692,660	3,702,314
3,665,618	3,685,742	3,692,883	3,702,630
3,668,309	3,685,747	3,693,029	3,703,599
3,669,143	3,685,936	3,693,340	3,703,637
3,671,121	3,685,994	3,693,475	3,705,132
3,671,174	3,686,014	3,693,478	3,706,829
3,671,360	3,686,135	3,693,533	

Patents Available for Licensing or Sale

D. 222,363. DECORATIVE HANGING INCLUDING SKELETAL FRAMEWORK. Clifton Bullard, 310 Prescott Place, Plainfield, N.J., 07063.

3,082,571. TOY. John E. Lewis, ASSN, San Francisco, Calif., 96307.

3,338,474. COLLAPSIBLE SPIRAL DISPENSING CONTAINER. Carl C. Olson, 3804 N. Janssen Ave., Chicago, Ill., 60613.

3,376,992. TAMPER-PROOF CONTAINER AND CAP CONSTRUCTION. Frank O. Klapp, Sr., 70 Warren St., Tiffin, Ohio, 44883.

3,465,373. HOSPITAL BED. Harriet A. Wilson, 115 Hilltop Road, Waverly, Pa., 18471.

3,524,659. MULTI-PURPOSE TRANSPORTATION APPARATUS. Katherine M. Filter, Rte. 3, Box 61–B, Crosby, Minn., 56441.

3,570,507. ICE FISHING NET. Morris Kashuba, 1563 Main St., Peckville, Pa., 18452.

3,572,816. VEHICLE SEAT. Robert L. Brown, 322 Davis Drive, Kingston, Tenn., 37763.

3,585,944. SUSPENDED SHELVING. Lewis R. Scheer, 1726 N. Lagoon Ave., Wilmington, Calif., 90744.

3,587,204. BAG CLOSING AND CLINCHING APPARATUS. Wallace W. George, 906 W. Crost St., Anderson, Ind., 46012.

3,596,757. MONEY CLIP. Patrick T. Cocchiaraley, 350 Wayland Road, Cherry Hill, N.J., 08034.

3,667,729. GATE CLOSURE APPARATUS. R. J. Hinkel. Correspondence to: Charles L. Rubow, 3170 N. Victoria St., St. Paul, Minn., 55112.

3,689,108. BODY TILTING MECHANISM. James A. Blonar, Rte. 2, Box 249A, Barrington, Ill., 60010.

3,641,805. SHEET METAL PULLER. Edward C. Reinke, 4823 Eaton, Denver, Colo., 80212.

3,697,046. COMBINED, JACK, AND CLAMP, SURE, CLAMP. Ferdinand F. Sur, R.R. 3, Effingham, Ill., 62401.

3,699,499. UNIVERSAL ELECTRIC CONNECTOR. Conan H. Spaderna, 54 Warner St., Springfield, Mass., 01108.

3,708,715. GOLF SWING PRACTICE DEVICE. Trentis E. Barney et al., 1719 Madrone Ave., West Sacramento, Calif., 95691.

3,710,413. ELECTRIC RAZOR CLEANER. Willis E. French, 7230 Raintree Drive, Citrus Heights, Calif., 95610.

3,713,690. VEHICLE BODY BOX EQUIPPED WITH AT LEAST ONE SLIDING DOOR. Lutz Knothe et al. Correspondence to: Werner W. Kleeman, Suite 212, Crystal Plaza 1, 2001 Jefferson Davis Highway, Arlington, Va., 22202.

3,715,881. DISPLAY CONTROL DEVICE FOR TIMEPIECES. Pierre Girard. Correspondence to: Stevens, Davis, et al., 1911 Jefferson Davis Highway, Suite 600, Crystal Mall 1, Arlington, Va., 22202.

The following 2 patents are offered by: Avery V. Deaver, 19 Calle 13–48 Zona 1, Guatemala City, Central America.

3,451,076. SUBMERGED CORK RECOVERY DEVICE.

3,542,278. BEVERAGE CONTAINER WITH STRAW.

The Laitram Corporation offers non-exclusive licenses under the following patent.

Inquiries should be directed to: The Laitram Corporation, P.O. Box 50699, New Orleans, La., 70150.

3,276,878. PROCESS FOR PEELING PRECOOKED SHRIMP.

National Starch and Chemical Corporation is prepared to grant licenses upon reasonable terms under the following patent.

Inquiries regarding the patent should be addressed to: Patents Department, National Starch & Chemical Corp., 1700 W. Front St., Plainfield, N.J., 07063.

3,322,656. METAL SURFACE OF IMPROVED BONDING QUALITY.

The General Tire & Rubber Company is prepared to grant non-exclusive licenses at reasonable royalty rates under the following patent.

Inquiries respecting licenses should be addressed to: General Tire & Rubber Co., 1 General St., Akron, Ohio, 44309.

3,574,149. FLAME RETARDANT FLEXIBLE POLYURETHANE FOAMS.

The Insurance Institute for Highway Safety is prepared to grant non-exclusive royalty-free licenses under the following patent restricted to use of the patented invention solely in the field of highway safety.

Inquiries respecting licenses should be addressed to: The Insurance Institute for Highway Safety, Watergate Six Hundred, Washington, D.C., 20037.

3,711,251. DETECTION OF ORGANIC VAPOR CONTAMINANTS IN AIR.

Spectral Data Corporation is prepared to grant non-exclusive licenses upon reasonable terms under the following patent.

Correspondence should be directed to the: President, Spectral Data Corporation, 6 Aerial Way, Syosset, N.Y., 11791.

3,715,962. SPECTRAL-ZONAL COLOR RECONNAISSANCE SYSTEM.

The General Electric Company is prepared to grant non-exclusive licenses under the following 2 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Francis K. Richwine, Patent Counsel, Ordnance Systems Department, General Electric Co., 100 Plastics Ave., Pittsfield, Mass., 01201.

3,648,636. ACOUSTIC GUIDANCE SYSTEM.

3,649,895. MOTOR CONTROL SYSTEM.

Erratum

In the OFFICIAL GAZETTE of February 13, 1973, the following patent was listed as being available for licensing or sale offered by: RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of Americas, New York, N.Y., 10036, should read as follows:

3,706,889. MULTIPLE-PHASE LOGIC CIRCUITS.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 20, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-02-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-10-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-15-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-08-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-31-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-26-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-15-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-04-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	5-26-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-03-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-05-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	4-10-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-28-72

Expiration of patents: The patents within the range of numbers indicated below expire during April 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,740,117 to 2,743,441, inclusive
Plant Patents..... Numbers 1,467 to 1,471, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED APRIL 3, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T909,001

HEAT STABLE MICROENCAPSULATED FIRE EXTINGUISHING AGENTS

Robert L. Combs and Willis C. Wooten, Jr., both of P.O. Box 511, Kingsport, Tenn. 37662

Continuation of abandoned application Ser. No. 37,303, May 14, 1970. This application Jan. 28, 1972, Ser. No. 221,839

Int. Cl. A62d *1/00*

U.S. Cl. 252—2

No Drawing. 17 Pages Specification

Heat stable microencapsulated fire extinguishing agents which, when dispersed in moldable or extrudable compositions, render such compositions and products produced therefrom self-extinguishing. These microencapsulated agents are particularly characterized in that the encapsulating wall is composed of a substance such as a silicate, a silicone, an epoxy resin, a fluorine-containing polymer, or the like which will not rupture and release the fire extinguishing agent at temperatures up to about 350° C. The microencapsulated fire extinguishing agents will not discolor, degrade, or form voids in the base polymer under normal processing conditions, and will not plug spinerette orifices when compositions containing them are employed in melt or solution spinning.

T909,002

IDENTIFICATION PRINTER FOR PLASTIC PARTS

Neil S. White and Richard R. Mosman, both of 1669 Lake Ave., Rochester, N.Y. 14650

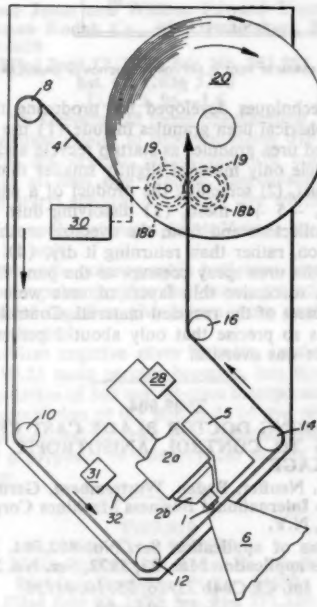
Filed Mar. 2, 1972, Ser. No. 231,213

Int. Cl. B44b *7/00*

U.S. Cl. 101—27

1 Sheet Drawing. 7 Pages Specification

An identification printer for embossing or imprinting a character such as a number into a plastic part wherein a heated die having a projecting character is moved by any suitable mechanism from a normal retracted position to an imprinting position, in which the die character penetrates and imprints a corresponding character into the part. A mechanism for controlling the depth of the imprint comprises a longitudinally adjustable probe movable with the die, a low pressure air supply for supplying a continuous stream of air through the probe, and a fluid pressure sensor for sensing the air pressure in the probe, and in response to a predetermined pressure, deactivating the die moving mechanism. The predetermined pressure is generated when the probe is moved to a preselected distance from any suitable surface corresponding to a desired depth of penetration of the die character into the part. The die moving mechanism, when deactivated, returns to its normal retracted position. To imprint colored characters into a plastic part, a colored printing tape in



web form is pulled from a stockroll and is suitably guided between the heated die character and the part.

T909,003

PAN GRANULATION OF UREA

Gordon C. Hicks, 3307 19th Ave., and Melvin M. Norton, Virginia Shores, Rte. 1, both of Sheffield, Ala. 35660

Filed Mar. 22, 1972, Ser. No. 236,882

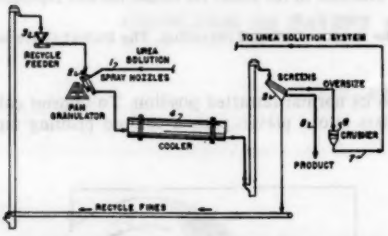
Int. Cl. C07c *127/00*

U.S. Cl. 260—555

1 Sheet Drawing. 9 Pages Specification

A process for producing in a pan granulated large and closely sized urea granules eminently suitable for sulfur overlay and the like, wherein a concentrated solution of about 98–99 percent concentration is sprayed into the pan granulator (as in McCamy et al., U.S. 3,165,395) but wherefrom the subsequent drying step and equipment is eliminated. Alternatively, more highly concentrated

urea feed may be utilized (as in Thompson et al., U.S. 3,408,169) without the requirement of mechanical deflection inwardly of the solid particles across the face of the pan, and wherein the spray headers need not necessarily be located in the upper right hand quadrant thereof. The temperature in the pan is maintained from 200° F. upward to 250° F., but preferably from about 200° to 210° F. About 3 pounds of recycled undersize are required per pound of product.



FLOW DIAGRAM OF PILOT PLANT FOR PRODUCTION OF GRANULAR UREA

Novel techniques developed for producing the large, smooth, spherical urea granules include (1) use of large, closely sized urea granules as startup recycle and continuing to recycle only material slightly smaller than the desired product, (2) screening the product of a narrow size range, e.g., −5 +7 mesh, (3) dissolving dust from the dry dust collectors and from the oversize crusher in the urea solution, rather than returning it dry, (4) carefully regulating the urea spray pressure to the pan. With these techniques, successive thin layers of urea were built up on the surfaces of the recycled material. Control of granulation was so precise that only about 1 percent of the pan product was oversize.

T909,004

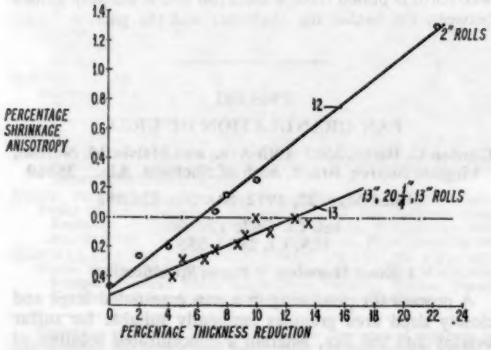
CALENDERING DOCTOR BLADE CAST CERAMIC SHEETS TO CONTROL ANISOTROPIC FIRING SHRINKAGE

Wilfried K. Neuffer, Baden, Wurttemberg, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 802,504, Feb. 26, 1969. This application Mar. 23, 1972, Ser. No. 237,567

Int. Cl. C04b *33/26, 35/10, 41/20*
U.S. Cl. 264—56

1 Sheet Drawing. 8 Pages Specification



A green ceramic sheet produced by doctor blade casting of a particulate slip containing, e.g., finely divided alumina, polyvinyl butyral, dibutyl phthalate, a wetting agent and a solvent for the polyvinyl butyral, is characterized by shrinkage anisotropy, i.e., the shrinkage of the sheet measured after firing is less in the casting direction than in the transverse direction. This anisotropy can be substantially eliminated by subjecting the green sheet to an experimentally determined thickness reduction achieved by passing the dried sheets through a series of pressurized rolls which also elongates and densifies the dried sheet. Factors that are significant to the effect of thickness reduction on the elimination of shrinkage anisotropy are temperature, roll diameter, roll pressure, roll speed, and the composition of the casting slip. Also, another application is mentioned wherein the shape of the doctor blade and the material used in its construction can be specially designed and selected to reduce shrinkage anisotropy.

T909,005

CONTINUOUS MANUFACTURE OF BREAD

Donald F. Meisner, Arlington Heights, and Raymond G. Robertson, Rolling Meadows, Ill., assignors to Kraftco Corporation, New York, N.Y.

Continuation of application Ser. No. 33,872, May 1, 1970. This application May 17, 1972, Ser. No. 254,329

Int. Cl. A21d *2/16*
U.S. Cl. 99—90 CB

No Drawing. 14 Pages Specification

Bread dough is continuously manufactured by a process wherein a yeast brew is provided in a first mixing chamber, a fat blend which may be substantially free of hard fat but which comprises a dough conditioning agent is prepared in a second mixing chamber. The fat blend and yeast brew are blended to provide a pre-mix. The pre-mix is then mixed with sufficient flour to provide a bread dough.

T909,006

SOLUTION POLYMERIZATION

Glen Alliger, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of application Ser. No. 55,868, July 17, 1970. This application May 22, 1972, Ser. No. 255,911

Int. Cl. C08d *7/02, 9/00*
U.S. Cl. 260—5

1 Sheet Drawing. 7 Pages Specification

The vulcanization of mixtures of polymer latices with solution-polymerized polymers such as (1) homopolymers and copolymers of conjugated dienes of 4 or 5 carbon atoms, (2) copolymers of such a conjugated diene and a vinyl monomer, and (3) blends thereof, is accelerated by 2-benzothiazyl-N,N-dialkyl thiocarbamyl sulfide in which the alkyl groups contain 1 to 20 carbon atoms, the mixture being compounded with ingredients including carbon black and sulfur, and then de-solventizing, dewatering and drying, and then vulcanizing.

T909,007

PREPARATION OF FILM VIA A TUBULAR PROCESS

Paul E. Holloway, Jr., New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

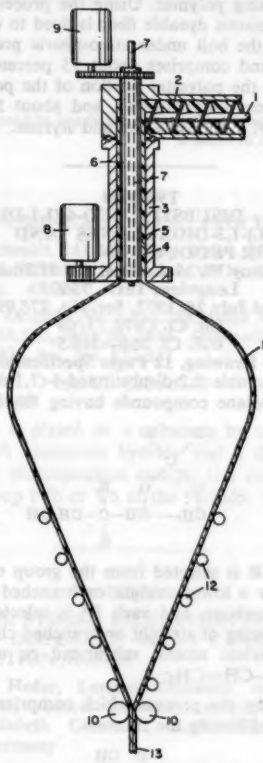
Filed June 6, 1972, Ser. No. 260,228

Int. Cl. B29c *5/05, 23/00;* **B29d** *7/22*
U.S. Cl. 264—95

1 Sheet Drawing. 6 Pages Specification

An improved method of preparing films of highly viscous hydroxypropyl cellulose to minimize the effect of friction-induced longitudinal orientation on later balancing of longitudinal and transverse orientation is disclosed. The technique comprises subjecting the film to a transverse frictional drag during extrusion by extruding the polymer thru a tubular die having rotatable forming surfaces, i.e. die body and mandrel. The rate of rotation can be varied to effect a substantially balanced degree of friction-induced orientation or a preponderance of orienta-

tion in the circumferential direction. An ancillary benefit is that the rotation substantially wipes out weld lines



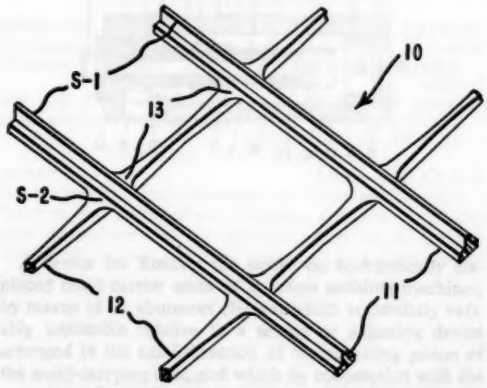
formed by the polymer flowing around the mandrel support.

T909,008
NETTING MEMBER

Vernon Paul Fruehauf, Williamsville, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of abandoned application Ser. No. 59,124, July 29, 1970. This application June 8, 1972, Ser. No. 260,824

Int. Cl. B32b *3/10*
U.S. Cl. 161—109
1 Sheet Drawing. 9 Pages Specification



In a cleaning pad fabricated from an open-mesh fabric material so that the fabric material forms at least a part of the external surface, the improved open-mesh fabric comprising:

a thermoplastic netting member having two layers of parallel extruded strands that intersect with each other,

said intersections of strands being integrally extruded joints which are complete unions of the crossing strands and

at least one rib-like projection extending from each of the strands of one of the layers of parallel extruded strands with

said rib-like projections extending through each of the integrally-extruded joints,

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T909,009
SUPERSENSITIZING DYE COMBINATION FOR ELECTROPHOTOGRAPHIC COMPOSITION AND ELEMENT

Jean Elmore Jones and William Edward Yoerger, both % Eastman Kodak Co., 1669 Lake Ave., Rochester, N.Y. 14650

Filed June 12, 1972, Ser. No. 261,881
Int. Cl. G03g *5/06*
U.S. Cl. 96—1.6
No Drawing. 25 Pages Specification

This invention relates to supersensitizing dye combinations useful for organic photoconductive compositions comprising: at least one cyanine, merocyanine, rhodacyanine or styryl spectral sensitizing dye which

(1) has an anodic polarographic half-wave potential less than +1.0 volt;

(2) has an anodic polarographic half-wave potential and a cathodic polarographic half-wave potential which, when added together, give a sum more negative than −0.10 volt; and

(3) desensitizes negative silver bromide emulsions, containing 99.35 mole percent bromide, less than 0.4 log E at a radiation of 365 nm. wherein incorporated therein at a concentration of 0.2 millimole of dye per mole of silver halide; and at least one electron-accepting dye such as a pyrylium or thiapyrylium salt as the supersensitizer.

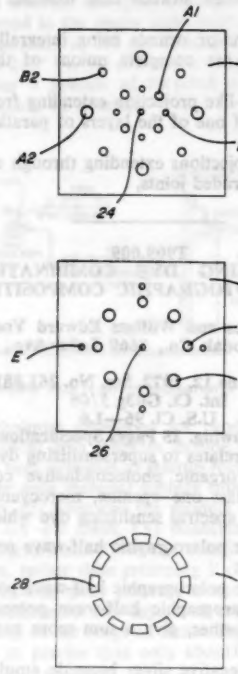
T909,010
SPATIAL FILTER

John R. Kelch, % Eastman Kodak Co., Kodak Park Division, Rochester, N.Y. 14650

Filed July 13, 1972, Ser. No. 271,339
Int. Cl. G02b *5/20*
U.S. Cl. 350—162 SF
3 Sheets Drawing. 13 Pages Specification

An improved spatial filter for use in an optical system and with which the quality of the projected image is enhanced comprises a transparent support and filter areas arranged in a particular array on a surface of the support. The array is symmetrical with respect to the optical axis of the projection system, when the filter is positioned therein. The spatial filter is produced by exposing a photographic plate positioned in the Fourier transform plane of the optical system to a number of light sources, the beams of which are directed through a circularly symmetric array of apertures in a plate as shown in the drawings. The resulting filter after processing, is a corresponding array of areas whose density is an increasing function of radial distance from the optical axis. The filter is positioned in the Fourier transform plane of a transparency having a variable density image. When the transparency is arranged relative to the axis of the optical projection system, it is illuminated with a plurality of generally parallel light beams of uniform diameter and intensity which are produced by a plate having an array of holes arranged in the same manner as those in the plate used to form the spatial filter but in which the holes are

of the same size or smaller than the corresponding holes in the plate used to form the spatial filter. This pattern of light is diffracted by the transparency and with the use



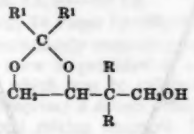
of a spatial filter having light-absorbing areas, enhancement of the sharpness and quality of the projected image is achieved.

T909,011
DYEING PROCESS
John R. Schwier, Rte. 6, Kingsport, Tenn. 37660
Filed July 18, 1972, Ser. No. 272,836
Int. Cl. D06p *5/00*
U.S. Cl. 8—168
No Drawing. 9 Pages Specification

Disclosed is a process comprising contacting, under dyeing conditions, in the presence of at least 30% O.W.F. sulfamic acid, an anionic dye and an anionic dyeable fiber of a blend of 96 to 93 weight percent, based on the weight of the blend, of a polyetherester and 4 to 7 weight percent, based on the weight of the blend, of a basic nitrogen containing polymer. Using the process of the invention, the anionic dyeable fiber is dyed to deep shades, preferably at the boil under atmospheric pressure. Preferably the blend comprises about 95 percent polyetherester, wherein the polyester portion of the polyetherester is poly(ethylene terephthalate), and about 5 percent of a copolymer of 2-vinylpyridine and styrene.

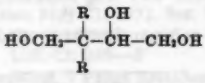
T909,012
NOVEL 2,2 - DISUBSTITUTED-4-(1,1-DIALKYL-2-ETHANOL)-1,3-DIOXOLANES AND PROCESS FOR THEIR PRODUCTION
Anthony W. McCollum, 404 Hillmont, Longview, Tex. 75601
Filed July 28, 1972, Ser. No. 275,998
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9
No Drawing. 12 Pages Specification

Water - insoluble 2,2-disubstituted-4-(1,1-dialkyl-2-ethanol)-1,3-dioxolane compounds having the formula



wherein each R is selected from the group consisting of hydrogen or a lower straight or branched chain alkyl of 1 to 4 carbons, and each R^1 is selected from the group consisting of straight or branched chain alkyl of 1 to 10 carbon atoms, substituted or unsubstituted phenyl, or $—CH=CH_2$;

are prepared by the process which comprises reacting a triol compound having the formula



wherein each R is as defined hereinabove,

at a temperature of between about 40° C. and about 150° C. in the presence of an acid catalyst such as p-toluenesulfonic acid with at least an equal molar amount of a carbonyl compound having the formula

wherein each R^1 is as defined hereinabove.

REISSUES

APRIL 3, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,606

ALUMINUM PLATING PROCESS

Donald L. Schmidt, 2412 St. Marys Drive, Midland, Mich. 48640, and Reinhold Hellmann, 30526 Bluehill, Roseville, Mich. 48066

No Drawing. Original No. 3,462,288, dated Aug. 19, 1969, Ser. No. 558,583, June 20, 1966. Application for reissue Aug. 16, 1971, Ser. No. 172,331

Int. Cl. C23c *3/00*

U.S. Cl. 117—37 **56 Claims**

Aluminum is plated on a substrate by contacting the substrate with aluminum hydride and a decomposition catalyst. The decomposition catalyst is a compound of a metal of Group IVb or Vb of the Periodic Table or mixtures thereof.

27,607

DEVICE FOR STROKE LIMITATION OF HYDRAULICALLY DISPLACED MOLD CARRIER UNITS ON INJECTION MOLDS

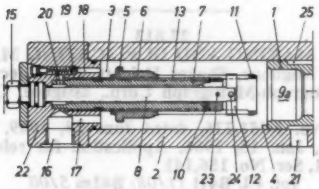
Heinz Karl Hofer, Langenholzhausen, and Friedrich Rehmsmeier, Vlotho, Germany, assignors to Stubbe Maschinenfabrik G.m.b.H., Kalletal-Kalldorf, near Vlotho, Germany

Original No. 3,571,855, dated Mar. 23, 1971, Ser. No. 742,384, July 3, 1968. Application for reissue July 27, 1971, Ser. No. 166,369

Claims priority, application Germany, July 5, 1967, P 15 83 703.3

Int. Cl. B29f *1/00*

U.S. Cl. 425—450 **8 Claims**



A device for limiting the stroke on hydraulically displaced mold-carrier units of injection molding machines, by means of an abutment element which is infinitely variably adjustable relative to a setting or adjusting device arranged in the axial direction of the actuating piston of the mold-carrying unit, and which by cooperation with the actuating piston, limits the stroke end position thereof.

27,608

PRODUCTION OF BORON NITRIDE

Eugenio Lubatti and Salvatore Pappalardo, Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Original No. 3,420,629, dated Jan. 7, 1969, Ser. No. 541,953, Apr. 12, 1966. Application for reissue Oct. 9, 1970, Ser. No. 79,633

Claims priority, application Italy, Apr. 13, 1965, 8,193/65; June 22, 1965, 13,949/65

Int. Cl. C01b *21/06*

U.S. Cl. 423—290 **8 Claims**

Described is a process for producing boron nitride. A boron-containing substance selected from the group consisting of boric acid, boric anhydride and hydrated borate is mixed with recycled boron nitride from a subsequent step. The mixture is heated to drive off water when using boric acid or hydrated borate. It is then finely ground when using boric acid or boric anhydride. Thereafter the mixture is nitrided by heating in a stream of ammonia to form boron nitride. The boron nitride produced is ground and part of the ground boron nitride is recycled to a previous step and the remainder is purified.

27,609

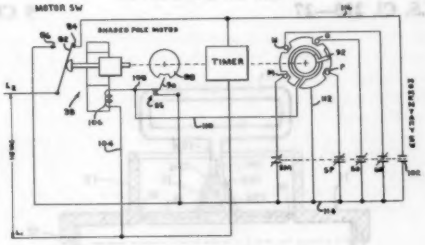
TIMER

Donald M. Strathearn, Arlington Heights, Ill., James M. Thornbery, Milwaukee, Wis., and Dale F. Wilcox, Aurora, Ill., assignors to Controls Company of America, Melrose Park, Ill.

Original No. 3,564,279, dated Feb. 16, 1971, Ser. No. 55,899, Sept. 14, 1960, which is a division of Ser. No. 799,780, Mar. 16, 1959. Application for reissue Nov. 1, 1971, Ser. No. 194,722

Int. Cl. H01h *43/12*

U.S. Cl. 307—141 **23 Claims**



The combination with a timer of the type having a motor for driving, a switch operating cam bank at tim-

ing speed through a transmission, of means for driving the cam bank to a preselected starting position comprising, a second motor for driving the cam bank through said transmission, means responsive to energization of the second motor to deenergize the first motor and responsive to deenergization of the second motor to energize the first motor, and clutch means operative upon deenergization of the second motor to disengage the second motor from the transmission to thereby remove the inertia of the second motor from the transmission.

27,610

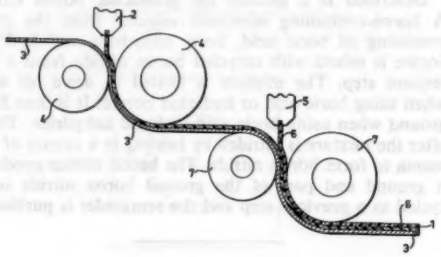
PACKAGING MATERIAL INCLUDING AT LEAST THREE LAMINATION LAYERS OF MATERIALS HAVING DIFFERENT VISCOSITIES, AND A PACKAGE PRODUCED THEREFROM

Hans Anders Rausing, Kraftstorg 8, and Thorsten Lennartsson Lindh, Ferievagen 10, both of Lund, Sweden

Original No. 3,553,073, dated Jan. 5, 1971, Ser. No. 526,471, Feb. 10, 1966. Application for reissue Oct. 6, 1971, Ser. No. 187,091

Int. Cl. B32b *7/02, 27/08, 27/10*

U.S. Cl. 161—166 **3 Claims**



A laminated packaging material is disclosed comprising an outer layer of paper, an inner heat sealable layer of polyethylene, and an intermediate layer of polypropylene.

27,611

EASILY OPENABLE SEALED PLASTIC CLOSURE AND METHOD

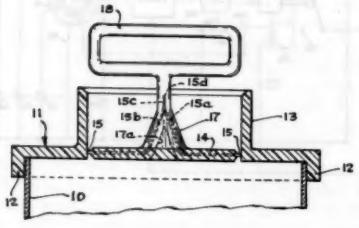
John S. Song, Addison, Ill.

(2 Williamsburg Circle, Evanston, Ill. 60203)

Original No. 3,567,061, dated Mar. 2, 1971, Ser. No. 839,973, July 8, 1969. Application for reissue Apr. 21, 1971, Ser. No. 136,133

Int. Cl. B65d *17/00*

U.S. Cl. 220—27 **9 Claims**



The "score" line in a plastic wall, provided to define a line of comparatively easy tearing, is brought to a point at one side of an abutment integral with said wall. A handle is provided on the plastic in the area within the score line and immediately adjacent the point. Pulling on the handle applies a force at the point at which a tear will commence and continue along the score line. Because the score line comes to a point outside the plane of the wall it will more readily tend to break at that point rather than merely stretch. This tendency is enhanced by a notching of the score line at the terminus of the point.

27,612

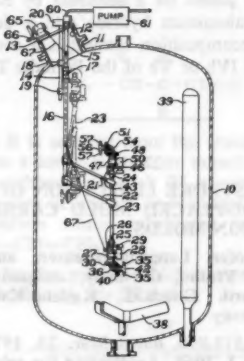
JET SPRAY TANK CLEANER

Donald B. Ruppel, Akron, and Norman E. Reinhart, Cuyahoga Falls, Ohio, and Lee F. Stalker, Louisville, Ky., assignors to The B. F. Goodrich Company, New York, N.Y.

Original No. 3,599,871, dated Aug. 17, 1971, Ser. No. 839,896, July 8, 1969. Application for reissue Dec. 9, 1971, Ser. No. 206,350

Int. Cl. B05b *3/10*

U.S. Cl. 239—227 **9 Claims**



A portable high pressure jet spray cleaning apparatus with collapsible features for use in cleaning the agitator blades and the interior surfaces of tanks and vessels utilizing a plurality of rotatable high-pressure spray nozzles which rotate in a changing geometrical pattern for directing a high pressure stream of fluid against the interior wall surfaces of tanks and vessels.

27,613

MASTER MAKING AND DUPLICATING MACHINE

Albert E. Mignone, Shaker Heights, Ohio, deceased, by Addressograph-Multigraph Corp., assignee, Cleveland, Ohio

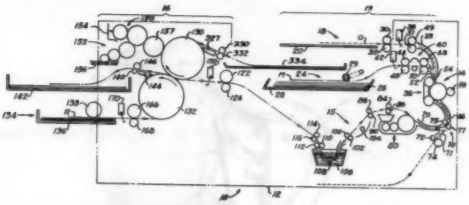
Original No. 3,451,336, dated June 24, 1969, Ser. No. 520,492, Jan. 13, 1966. Application for reissue June 23, 1971, Ser. No. 156,141

Int. Cl. B41l *11/08;* **B41m** *5/00*

U.S. Cl. 101—132.5 **4 Claims**

There is described an apparatus (and the method according to which it operates) for handling one or more original documents presented to the equipment, and rapidly producing from each original a desired number of printed duplicates. In particular the apparatus includes a master making portion which exposes a charged photoconductive sheet to a light and shadow image of the original to form a reverse reading latent electrostatic image thereon, develops the latent image thus formed on the sheet, and treats the sheet to convert the surface coating in the background areas to hydrophilic condition so that the sheet may perform as a lithographic master. The

apparatus also includes an automated direct printing rotary lithographic duplicator which mechanically takes each master thus prepared, places it on the master cylinder, prints by direct contact between the master and receiving sheets, making the desired number of copies in accordance with a preset counter setting, discharges the master, and then triggers the master making section to accept and process another waiting original. Also described is a sequencing control which provides for overlapping of



cycles so that whenever there is a series of originals awaiting processing, a second original may have its master prepared and brought to a position awaiting use while the master from a first original is printing copies, and a third original is at a ready location where it will be automatically picked up and fed into the master making section to have a master prepared therefrom at the instant the first master is discharged from the master cylinder of the duplicator section and the second master placed thereon.

27,614

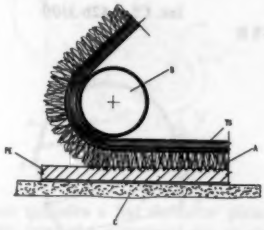
WATERPROOF FABRIC AND METHOD FOR FORMING THE SAME

Augusto J. Brunner, Vacallo, Switzerland, and Fulvio Costa, Turin, and Luigi Falcone, Como, Italy, assignors to FLEXA Industria Materie Plastiche S.p.A., Gallarate, Varese, Italy

Original No. 3,481,821, dated Dec. 2, 1969, Ser. No. 497,799, Oct. 19, 1965. Application for reissue Feb. 28, 1972, Ser. No. 230,051

Int. Cl. B32b *3/26, 3/06*

U.S. Cl. 161—53 **17 Claims**



A composite material useful for the manufacture of garments comprising a fabric base in the form of a run-proof knitted fabric of natural, artificial and synthetic fibers, air cells obtained through loops defining a raised surface of the fabric and being an uninterrupted continuation of the fabric and a water-proof layer or film formed by an elastomeric material disposed upon the crest of the loops but spaced apart from the base fabric. Methods for making the composite material are described.

PATENTS

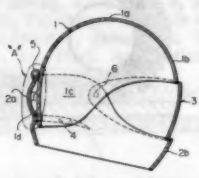
GRANTED APRIL 3, 1973

GENERAL AND MECHANICAL

3,723,992
SUBSTANTIALLY DOUBLE-SHELL HELMET

Eitaro Kamata, Tokyo, Japan, assignor to Shoei Kokoh Co., Ltd., Tokyo, Japan

Filed July 29, 1971, Ser. No. 167,123
Claims priority, application Japan, April 20, 1971, 46/30085
Int. Cl. A42b 3/00
U.S. Cl. 2—3 R 4 Claims

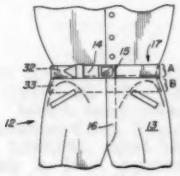


A protective helmet which comprises a substantially double-shell including a cap, a bumper ring, visor and a space defined by the cap and the ring, and which is capable of substantially protecting the driver or the racer of motorcycle, car, or motorboat against skull fracture when the helmet is subjected to impact.

3,723,993
TROUSERS WAISTBAND STRUCTURE

Burton B. Ruby, Michigan City, Ind., assignor to Jaymor-Ruby, Inc., Michigan City, Mich.

Filed Dec. 2, 1971, Ser. No. 204,197
Int. Cl. A41d 1/06
U.S. Cl. 2—237 4 Claims



A trousers-supporting elastic and fabric waistband comprising an elastic band divided into belt and skirt portions covered by an outer, extensible fabric web. The elastic band is stitched to the fabric web on two spaced, parallel lines, so that the fabric web cooperates with the elastic band to form a belt with physically limited extensibility. Concealment of both belt and skirt portions of the elastic band by the overlying extensible fabric web assures an attractive, wrinkle-free outer trousers surface.

3,723,994
REINFORCED TROUSER POCKET

Cathern A. Tucker, 3150 16th St., N.W., Washington, D.C.

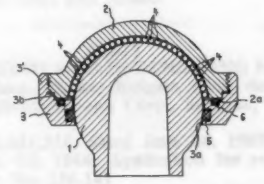
Filed May 1, 1972, Ser. No. 175,580
Int. Cl. A41d 27/20
U.S. Cl. 2—248 1 Claim

A reinforced trouser pocket, wherein that portion of the interior free-swinging pocket directly adjacent to the exterior trouser material is covered with a second layer of fabric of the exact same design and composition as the exterior trouser material itself, so that, should any hole be found in the exterior trouser material as a result of extended pressure from any item(s) carried in the pocket, a fabric of the exact same design and composition would show through, rather than an odd color cloth on the interior free-swinging pocket as is commonly the case, at the same time assuring double wear and extra security at this pressure point, as compared to a single thickness of cloth in current ordinary pocket construction.

3,723,995
PROSTHETIC HIP ENARTHROSIS

Friedrich Baumann, Neuburg an Der Danube, Germany, assignor to Osteo AG, Solothurn, Switzerland

Filed May 19, 1970, Ser. No. 38,680
Claims priority, application Switzerland, May 23, 1969, 7909/69
Int. Cl. A61f 1/24
U.S. Cl. 3—1 4 Claims



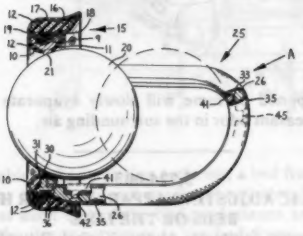
A prosthetic hip enarthrosis has a plurality of freely moving bearing balls occupying substantially the entire space between a ball provided for attachment to the femur and the concavity of a socket that is adapted to be attached to the pelvis to serve as a prosthetic acetabulum. A long-lasting lubricant is sealed in that space around the bearing balls by an agent, compatible with body tissue, which is carried by a locking ring that secures the ball in the socket in an adjustable manner so as to control the degree of mobility of the ball-and-socket joint.

3,723,996

CLOTH COVERED HEART VALVE WITH PROTECTED CAGE LEGS

Donald A. Raible, Orange, and Will R. Pierie, Newport Beach, both of Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 7, 1971, Ser. No. 205,506
Int. Cl. A61f *1/22*
U.S. Cl. 3—1 18 Claims



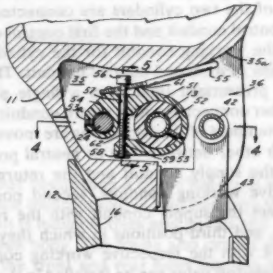
A cloth covering on the cage is protected on the inside surfaces of the cage legs by continuous metal track bars extending from the orifice ring to the apex of the cage. The track bars hold the movable valve member out of contact with the cloth to prevent wear on the cloth. In two embodiments the track bars form an inner metal cage nested in grooves in the legs of the main structural cage with the cloth coverings on the latter lining the grooves between the inner and outer cages. In another embodiment the track bars are of plastic material molded into the cloth coverings on the cage legs. In this embodiment the track bars project on both the inside and the outside of the cloth coverings and are held seated in grooves in the cage legs by the cloth coverings.

3,723,997

PROSTHETIC LEG WITH WEIGHT RESPONSIVE KNEE LOCK

John L. Kolman, Whittier, Calif., assignor to United States Manufacturing Company, Glendale, Calif.

Filed April 30, 1971, Ser. No. 134,262
Int. Cl. A61f *1/04*, *1/08*
U.S. Cl. 3—27 7 Claims



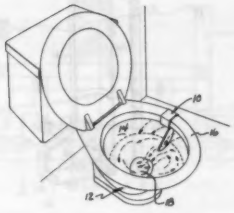
A knee structure for a prosthetic limb, which allows the shin portion to pivot with respect to the thigh portion about an axle and has a brake band around the axle with novel means for causing the brake band to tighten around the axle, when the wearer places weight on the limb, to allow the knee to lock at any angular position. The brake automatically releases when the weight is lifted off the limb.

3,723,998

TOILET BOWL ATTACHMENT

Robert D. Wehr, 4705 Arcadia Road, Tarpon Springs, Fla.

Filed April 5, 1972, Ser. No. 241,147
Int. Cl. A47k *17/00*
U.S. Cl. 4—1 6 Claims



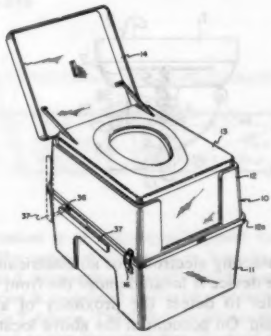
The attachment includes a flat deflector plate which extends downwardly from the peripheral rim to deflect water downwardly toward the outlet and thereby reduce the quantity of water required in a flushing operation. The plate has one edge shaped complementary to the toilet bowl and contiguous to it. The plate is mounted by an inverted U-shaped bracket which engages the rim.

3,723,999

PORTABLE WASTE DISPOSAL UNIT

Marvin Miller, Teaneck, N.J., assignor to Mileahead Industries Incorporated, Greenwich, Conn.

Filed Oct. 22, 1971, Ser. No. 191,595
Int. Cl. A47k *11/02*
U.S. Cl. 4—142 8 Claims



There is disclosed a portable unit for the reception of human waste having interrelated self-synchronizing equilateral polygon cage means for the sequential sealing and disposition in the unit of increments of plastic tube material containing waste.

3,724,000

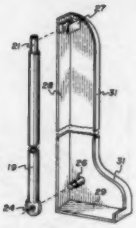
BATHTUB SHOWER SPLASH PLATE

Clarence Eakman, 308 Ash Ave., Chula Vista, Calif.

Filed March 29, 1971, Ser. No. 128,958
Int. Cl. A47k *3/14*
U.S. Cl. 4—148 2 Claims

A bathtub shower splash plate which is a generally L-shaped piece of non-water-soluble material extending up from one

outside corner of a bathtub edge and having a short leg extending along the bathtub side with a lip extending from an outside edge thereof to contain splashing water and a clamp



toward the top inside thereof for clamping a rod thereto which is rotatably attached to the splash plate at the bottom thereof for being rotated onto the edge of the bathtub and holding the shower curtain in place during use.

3,724,001

AUTOMATIC WATER-SUPPLY APPARATUS

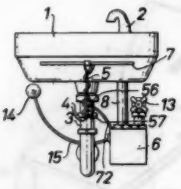
Masuo Ichimori, Mukomachi, and Hideyuki Suzaki, Kyoto, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 16, 1970, Ser. No. 11,540

Claims priority, application Japan, Feb. 14, 1969, 44/13216

Int. Cl. A47k *1/04*

U.S. Cl. 4—166 **13 Claims**



A proximity detecting electrode for an electrically controllable faucet valve device is located under the front bottom of the basin in order to detect the proximity of a man approaching the basin. On account of the above location of the electrode, the sensitivity of detection is improved, evading a disturbance by water drops sticking in or around the basin. And moreover, as a result of the above improvement of the sensitivity, tolerance for the position of the electrode can be widened, making the assembly of the automatic water-supply apparatus easier even for a person not so versed in electronics.

3,724,002

PERFUME OR DEODORIZER DISPENSER

Fred H. Buck, Jr., Boonton Township, Morris County, N.J., assignor to Arrowhead Industries Inc., Denville, N.J.

Division of Ser. No. 830,708, June 5, 1969, Pat. No. 3,575,345.

This application Oct. 19, 1970, Ser. No. 82,200

Int. Cl. A61l *3/00*

U.S. Cl. 4—222 **8 Claims**

A packet is provided having sealed therein paper or the like impregnated with oil and a perfume substance. The packet has attached thereto adhesive means for affixing the packet to the wall of a bathroom, car or other enclosure surface. When the packet is opened perfume will slowly evaporate therefrom creating a pleasant odor in the surrounding air.

3,724,003

HYDRAULIC ADJUSTING APPARATUS FOR HOSPITAL BEDS OR THE LIKE

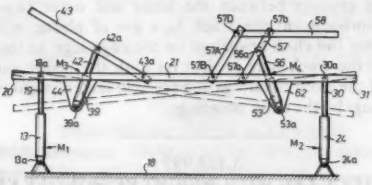
Hans Ellwanger, Stuttgart; August Kraisel, Bittenfeld; Walter Kraus, Moglingen, and Wilheim Zirps, Hemmingen, all of Germany, assignors to Robert Bosch GmBH, Stuttgart, Germany

Filed Jan. 3, 1972, Ser. No. 214,949

Claims priority, application Germany, July 8, 1971, P 21 34 061.4

Int. Cl. F01b *21/00, 21/08;* A61g *7/00*

U.S. Cl. 5—68 **15 Claims**

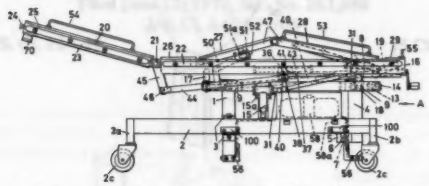


The head and foot ends of a mattress supporting frame or operating table are articulately connected with the piston rods of two hydraulic motors whose double-acting cylinders are articulately connected to a shiftable bottom frame. The lower chambers of the cylinders can be connected with a supply conduit for pressurized fluid by way of discrete working conduits and discrete solenoid operated directional control valves. The upper chambers of the two cylinders are connected to each other by a first control conduit and the first control conduit is connected with the working conduit for the cylinder at the head end by means of a second control conduit. The supply conduit receives pressurized fluid from a single pump and each valve is further connected with a return conduit for spent fluid. The valve members of the two valves are movable independently of each other between first or neutral positions in which they seal the supply conduit and the return conduit from the respective working conduits, second positions in which they connect the supply conduit with the respective working conduits, and third positions in which they connect the return conduit with the respective working conduits. A solenoid operated shutoff valve can be installed in the working conduit for the cylinder at the head end to seal the lower chamber of such cylinder from the supply and return conduits as well as from the respective working conduit and both control conduits when the foot end is to be raised or lowered without any changes in the level of the head end. The single pump can supply pressurized fluid to the motors for one or more additional frames or tables as well as to auxiliary cylinders which can move the head rest and/or the foot rest of a frame or table between different levels and/or different positions of inclination.

3,724,004
ADJUSTABLE BED

Gunter Behrens, Herford/Westphalia, Germany, assignor to Jon Stiegelmeyer & Co., GmBH, Herford/Westphalia, Germany

Filed June 1, 1971, Ser. No. 148,749
Int. Cl. A61g 7/00, 7/10
U.S. Cl. 5—68 4 Claims

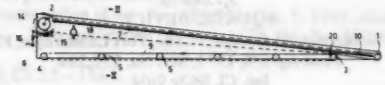


An adjustable bed comprising a chassis, a bed frame tiltable relative to the chassis, at least one linear actuator disposed on the chassis at each end of the bed, and means articulatedly connecting the linear actuators to the bed frame so that the bed frame may be moved to various elevated and longitudinally tilted positions, which means comprises an intermediate frame connected to the bed frame and the chassis, differential units connecting the intermediate frame to the linear actuators, said differential units being rigidly interconnected whereby the bed frame and intermediate frame are arranged to pivot about a longitudinal axis relative to the chassis, means arranged at the bed foot for ambilateral pivoting displacement of the bed frame and intermediate frame about the longitudinal axis, a split leg rest on the bed frame, a supportable back rest articulated in cantilever fashion in said bed frame, means for manipulating the back and leg rests, and at least one securing rail provided on said bed frame and adapted to support auxiliary appliances.

3,724,005
STRETCHER

Simon Stevens, Den Helder, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 22, 1971, Ser. No. 155,561
Claims priority, application Netherlands, July 11, 1970, 7010300
Int. Cl. A47b 83/04
U.S. Cl. 5—81 R 5 Claims

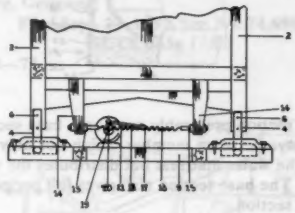


A stretcher comprising a frame having at least two parallel upper guides, incorporated in said frame on the front and rear sides. A belt is movable over said guides and arranged to support a human body. The frame also carries at least two lower guides on the front and rear sides forming part of a moving mechanism. The belt portion has a length which is at least equal to the distance between the two upper guides and, in the initial position of the stretcher, extends between the front upper guide and the rear lower guide. Two parallel extending cables or chains are secured to one side of the belt portion and are guided over wheels which are secured to the rear upper guide, then over wheels which are secured to the front lower guide, and then over wheels which are secured to the rear lower guide, the cables or chains then being secured to the other side of the belt portion.

3,724,006
AUTOMATIC MOTORIZED BABY CRIB

Alejandro L. Malabanan, 36 Recto Avenue, Lipa City, and Antonio T. Acepcion, Nasugbu, both of Philippines

Filed June 25, 1971, Ser. No. 156,731
Int. Cl. A47d 9/02
U.S. Cl. 5—109 1 Claim

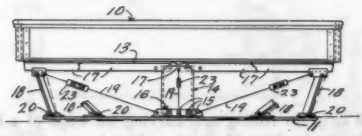


This invention relates to a motorized baby crib which includes a conventional crib proper with four downwardly extending corner posts, two at the transverse ends thereof. At the bottom end of each post is secured a corresponding roller. Rollers at one transverse end of the crib are positioned for lateral movement in corresponding grooves at the end portions of the transverse base members of the crib base. Transversely aligned at the middle of the crib proper are opposed downwardly extending supports. To the supports are secured the outer ends of a pair of opposed stretched coil springs, the inner ends of which are secured to one end of a push rod, the other end of which is in turn connected to an eccentric arm keyed to the shaft of a gear motor.

3,724,007
ADJUSTABLE SUPPORT FOR A WATER MATTRESS

Ralph L. Kuss, Findlay, Ohio, assignor to R. L. Kuss & Co., Inc., Findlay, Ohio

Int. Cl. A47c 27/08
U.S. Cl. 5—236 5 Claims



The invention is an adjustable support for a water-filled mattress. The support comprises a box-shaped carrier for receiving and supporting a water-filled mattress. The box-shaped carrier is supported over a base member by a plurality of adjustable T-beams. The T-beams are hinged from a central post attached to the base member. Each of the T-beams extends radially from the central post to a corresponding vertically adjustable carrier arm hinged to the periphery of the base member. Adjustable cables extending from the central post to each of the carrier arms supporting the T-beams provide means for raising or lowering the carrier arms and, in turn, the beams resting on the carrier arms for leveling and supporting the box-shaped bed carrier above the base.

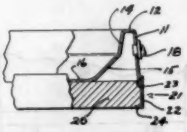
3,724,008
WATERBED BEDSTEAD

William Donald Golden, 6258 Ruthland Rd., Oakland, Calif.

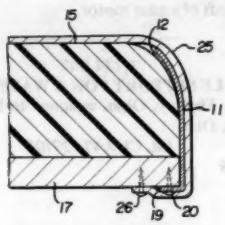
Filed Aug. 26, 1971, Ser. No. 175,165
Int. Cl. A47c 27/08
U.S. Cl. 5—348 WB 3 Claims

The waterbed bedstead in its preferred form is essentially a containment tank to hold a plastic bag containing water, or

water and other materials, to produce a water mattress. The containment tank section is formed of a thermoplastic material which is leak proof, should the water mattress be punctured, cut or for any other reason fail to contain the liquid. It also supplies a dead air space for thermal insulation. The containment tank section preferably rests on a base section containing a polystyrene foam member which not only supports the weight of the water mattress but distributes the weight over a large area. The base section also gives full peripheral support to the tank section.



3,724,009
SEAT BUN PULL STRIPS
Jere B. Ambrose, Pontiac, Mich., assignor to Northern Fibre Products Company, Birmingham, Mich.
Filed May 18, 1971, Ser. No. 144,09
Int. Cl. A47c 27/22
U.S. Cl. 5—360 **2 Claims**

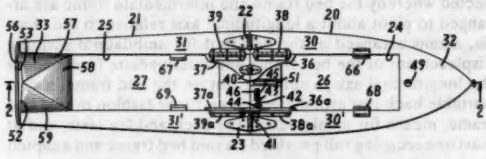


A pull strip for rolling and curving the edge of a box-like shaped foamed rubber-like seat cushion bun and securing the bun to a support platform, the strip being formed of a uniform width, narrow, flexible, cloth-like sheet, having a narrow, permanently tacky adhesive stripe on one face and only along one edge thereof for adhering the striped portion to an upper surface of the bun with the remainder of the strip extending outwardly of and along the bun edge, for manually pulling the free edge of the strip around the bun edge and securing it to the platform.

3,724,010
CUTTING TOOL
Albert S. Scholl, 2706 So. Kedvale, Chicago, Ill.
Filed Sept. 27, 1971, Ser. No. 184,072
Int. Cl. B25f 1/02; B26b 11/00
U.S. Cl. 7—14.1 A **10 Claims**

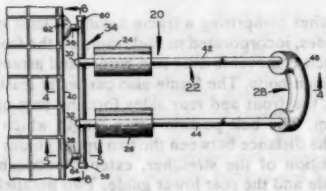
A hand operated tool for cutting and trimming mounted wall covering materials including paper, cloth, canvas, vinyl plastic, cork and the like. A large wiper blade for smoothing out the covering materials is provided with at least two marginal guide means which cooperate with an adjacent wall in guiding the tool for linear movement along the intersection of two walls. A knife blade is mounted in a holder fastened to the wiper blade in position to project beyond one corner of the wiper blade and guide means in accordance with the desired depth of cut, as dictated by the thickness of the covering material, and to dispose the cutting edge thereof at a proper angle for smoothly severing the covering material.

3,724,011
FOLDABLE BOAT
Roger A. Scholle, 8 White Birch Lane, Scarsdale, N.Y.
Filed May 7, 1971, Ser. No. 141,213
Int. Cl. B63b 7/00
U.S. Cl. 9—2 F **12 Claims**



A foldable boat is provided having stern and bow sections which can be unfolded and extended from a folded, collapsed and closely nested relationship to a rigid, unitary assemblage ready for use, said stern and bow sections being locked in the extended position by stiffening means which are hingeably associated with the assemblage. The foldable boat of the invention is of a size so that it can be readily transported from place to place on the roof of a car, rack of a station wagon or on the deck of a station wagon and is provided with means to be propelled by outboard motor, sail or oars.

3,724,012
AQUATIC DEVICE
Paul E. Sanderson, 61 Compass Lane, Fort Lauderdale, Fla.
Filed April 8, 1971, Ser. No. 132,294
Int. Cl. B63c 9/04
U.S. Cl. 9—311 **9 Claims**



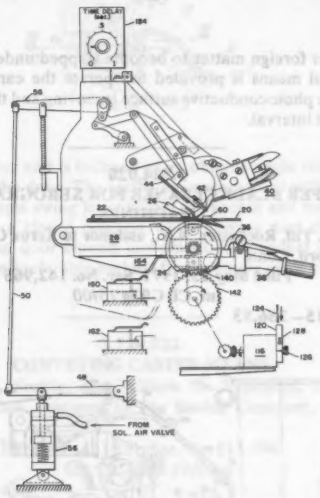
An aquatic device capable of floating in the water at the side of a pool and having a head rest at a distal end providing floating support for the head of a person while he exercises or practices swimming with his head on the head rest and his body stretched out in the water. The device preferably in-

cludes an anchoring structure for attaching the device to the side of the pool, and float means pivotally connected to the anchoring structure allowing pivotal movement of the device while floating and also allowing it to be raised out of the water.

3,724,013
RIB APPLYING MACHINE

Reginald P. Perry, Wellesley, and Nils W. Sjoberg, Lynn, both of Mass., assignors to Prime Manufacturing Company, Lynn, Mass.

Filed June 12, 1972, Ser. No. 262,080
Int. Cl. A43d *43/06*
U.S. Cl. 12—20 15 Claims

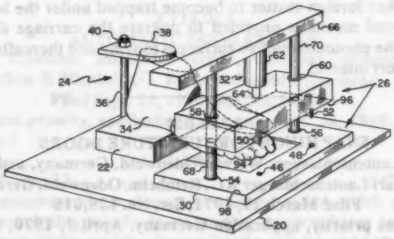


A rib laying machine in which the marginal spacing of the rib from the edge of the insole is automatically varied in a predetermined manner as the laying operation proceeds. Adjustments to accommodate for variations in size of the insoles are carried out by interchangeable program means quickly insertable in the machine when another size of insoles is to be run. The automatic adjustment effected by the interchangeable programming means also correlates the rib cut-off mechanism with insole size.

3,724,014
METHOD FOR RESHAPING A SHOE LAST

Delora E. Bennett, Middleboro, and Roger A. Packard, East Bridgewater, both of Mass., assignors to Delro Engineering Corporation, Boston, Mass.

Continuation of Ser. No. 883,550, Dec. 9, 1969, abandoned. This application Nov. 19, 1071, Ser. No. 200,422
Int. Cl. A43d *00/00*
U.S. Cl. 12—146 L 1 Claim

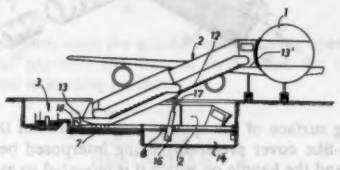


A heated thermoplastic material is applied to a shoe last which is clamped to a supporting member. A die member slidably mounted to the support is urged upon the thermoplastic material by a hydraulic actuator in consequence the thermoplastic material acquires and retains a form which is the complement of the mold cavity of the die. The die is formed with a reservoir for capture of excess thermoplastic material which is extruded when the thermoplastic material is compressed within the mold cavity.

3,724,015
AIRCRAFT LOADING RAMPS

Manfred Japes, Gustavsburg, Germany, assignor to Maschinenfabrik Augsburg-nurnberg Aktiengesellschaft, Nurnberg, Germany

Filed Sept. 23, 1970, Ser. No. 74,698
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 5 Claims

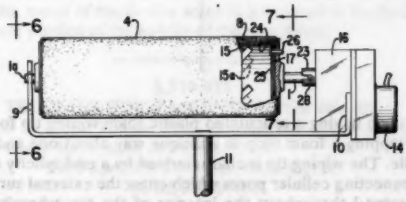


An arrangement on an airport having underground corridor means arranged underneath a portion of the airport terrain and leading to an airport terminal, in which gangway means adjustable in the direction of the longitudinal extension thereof has one end portion connectable to an entrance in an airplane while the other end portion is selectively movable into alignment with said corridor means, said gangway means being pivotable upwardly along a vertical plane from a position in a pit and is also adapted selectively to be lowered into said pit which then may be covered up and driven over, said gangway means also being movable along a horizontal plane.

3,724,016
POWER DRIVEN PAINTING DEVICE

Ernst Soffer, 84-50 Austin St., Kew Gardens, N.Y.

Continuation-in-part of Ser. No. 842,445, July 16, 1969, abandoned. This application Nov. 2, 1970, Ser. No. 85,921
Int. Cl. B05c *1/10*
U.S. Cl. 15—98 5 Claims



A paint applicator roller combination comprising an extendable handle, a rotating cylinder having perforations through the cylindrical surface and an absorbent cover, end means closing each end of said cylinder, means within said rotating cylinder to close said perforations, detachable means to mount said rotating cylinder on said extendable handle, a motor mounted on said extendable handle adjacent said rotating cylinder and transmission means connecting said motor and said rotating cylinder whereby said rotating cylinder rotates at a speed of from 75 to 100 rpm.

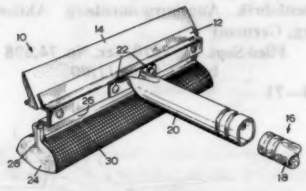
3,724,017
COMBINED SQUEEGEE AND SCOURING PAD WINDOW CLEANING IMPLEMENT

George R. Mallory, Blenheim, Ontario, Canada, assignor to Mallory Hardware Products Limited, Blenheim, Ontario, Canada

Filed July 1, 1971, Ser. No. 158,934
Claims priority, application Canada, July 30, 1970, 089547
Int. Cl. A47l *1/08*
U.S. Cl. 15—121 10 Claims

An improved window cleaning device of the type having a flexible wiper blade and a sponge mounted in a spaced parallel

relationship on a head having a manually engageable handle extending therefrom. The improvement comprising a netlike cover of nylon or the like having a pair of permanently set crease lines and secured in a position extending over the



sponging surface of the sponge so as to protect the sponge. The net-like cover preferably being interposed between the sponge and the handle on which it is mounted so as to further strengthen the sponge.

3,724,018

SWAB WITH FOAM PLASTIC WIPING TIP

Albert J. Sills, 117 Adams, Apt. No. 2, Glendale, Calif.

Continuation of Ser. No. 850,311, July 30, 1969, abandoned, which is a continuation-in-part of Ser. No. 749,064, July 31, 1968, abandoned. This application Aug. 4, 1971, Ser. No. 169,110

Int. Cl. A47l *13/46*

U.S. Cl. 15—244 R **1 Claim**

A swab having a reticulated plastic foam wiping tip formed by wrapping a foam strip in a unique way about one end of a handle. The wiping tip is characterized by a multiplicity of interconnecting cellular pores which enter the external surfaces and extend throughout the interior of the tip, whereby the swab is effective to remove foreign material from a surface by moving the tip across the surface in such a way that the material enters and becomes entrapped within the pores of the tip and to apply to a surface material contained within the pores by moving the tip across the surface while pressing the tip against the surface.

3,724,019

WIPER BLADE CLEANING APPARATUS FOR XEROGRAPHIC MACHINES

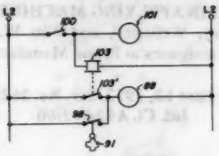
Alan L. Shanly, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 13, 1971, Ser. No. 142,964

Int. Cl. G03g *15/00*

U.S. Cl. 15—256.53 **5 Claims**

Apparatus for cleaning dry residual toner from the photoconductive surface of a xerographic type copying machine for reuse. The apparatus comprises a wiper blade disposed across the path of operating movement of the photoconductive surface with the wiping edge thereof in physical contact therewith. The wiper blade is supported on a carriage movable in a direction generally longitudinal of the blade. A driver is provided to slowly oscillate the carriage together with the wiper blade back and forth to improve blade cleaning action and wear, and reduce the tendency for toner



and other foreign matter to become trapped under the blade. A control means is provided to operate the carriage driver while the photoconductive surface is moving and thereafter up to a short interval.

3,724,020

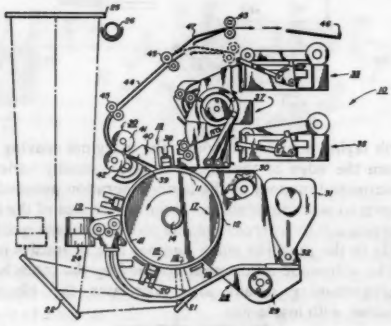
WIPER BLADE CLEANER FOR XEROGRAPHIC MACHINES

Henry R. Till, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 13, 1971, Ser. No. 142,965

Int. Cl. G03g *15/00*

U.S. Cl. 15—256.53 **5 Claims**



Apparatus for cleaning dry residual toner from the photoconductive surface of a xerographic type copying machine for reuse. The apparatus comprises a wiper blade disposed across the path of operating movement of the photoconductive surface with the wiping edge thereof in physical contact therewith. The wiper blade is supported on a carriage movable in a direction generally longitudinal of the blade. A driver is provided to slowly oscillate the carriage together with the wiper blade back and forth to improve blade cleaning action and wear, and reduce the tendency for toner and other foreign matter to become trapped under the blade. A control means is provided to operate the carriage driver while the photoconductive surface is moving and thereafter up to a short interval.

3,724,021

SNAP HINGE FOR FURNITURE DOORS

Karl Lautenschlaeger, Wersau/Odenwald, Germany, assignor to Karl Lautenschlaeger KG, Reinheim/Odenwald, Germany

Filed March 29, 1971, Ser. No. 129,016

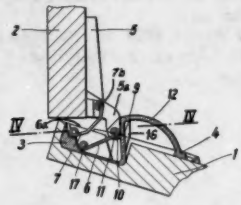
Claims priority, application Germany, April 7, 1970, P 20 16 398.8

Int. Cl. E05d *3/06*

U.S. Cl. 16—163 **10 Claims**

Furniture hinge of a snap type holding the door open after a predetermined movement of the door in a door opening

direction and exerting a closing force on the door as the door moves past a dead point toward its closed position. A socket member mortised in the door forms a stop for the door, a pivot support for two swing levers pivotally connected to a bracket member extending from a wall of the cabinet and hinging the door for movement about an imaginary axis. A spring formed integrally with the socket member extends outside of the

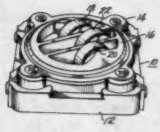


socket member and is inclined at an oblique angle relative to the plane of the door. The spring has engagement with an end of the innermost swing lever within the socket and moves the door toward a closed position when moving past the dead position, upon door closing movement. The socket member and spring are preferably molded from a single piece of plastic material.

3,724,022
CONVEYING CASTER MEANS

John Alberti, Seattle, and William W. Nanninga, Bellevue, both of Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 1, 1971, Ser. No. 111,396
Int. Cl. A47b 91/00
U.S. Cl. 16—45 **7 Claims**



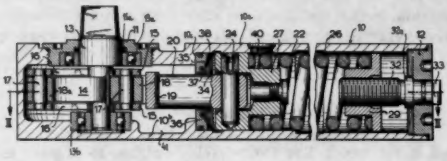
A swiveling base carrying a low profile axle supporting structure with three or more caster wheels arranged in a triangular supporting and conveying pattern for distributing the load and thereby being capable of continuously achieving automatic alignment with associated receiving cargo. In addition, the feature of receiving cargo is improved by the conical edge design of the swivel base and the spring loaded mounting of the base structure.

3,724,023
AUTOMATIC DOOR CLOSER

Horst Tillmann, Ennepetal-Voerde, Germany, assignor to Dorken & Mankel KG, Ennepetal-Vorde, Germany

Filed Sept. 22, 1970, Ser. No. 74,352
Claims priority, application Germany, Sept. 30, 1969, P 19 49 240.1
Int. Cl. E05f 3/10
U.S. Cl. 16—53 **5 Claims**

An automatic door closer wherein the spring which urges the door closing spindle to its starting position bears against the piston of the braking device for the spindle and against a retainer which is adjustable by means of a shaft extending from the housing of the door closer. In this way, the initial stress upon the spring can be changed in fully assembled and installed condition of the door closer. The cylinder of the braking device is rigid with the housing and has an end wall which faces the spindle and is traversed by the piston rod of the piston. The end wall serves as a support for a check valve which admits fluid into the compartment between such end

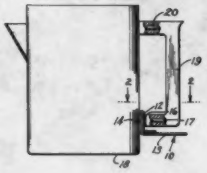


wall and the piston when the spindle rotates during opening of the door but prevents the flow of fluid when the spindle rotates toward its starting position.

3,724,024
HEAT SHIELD

William R. Anderson, 603 White Horse Pike, Hoddon Heights, N.J.

Filed April 20, 1971, Ser. No. 135,724
Int. Cl. A47b 95/02
U.S. Cl. 16—116 **1 Claim**

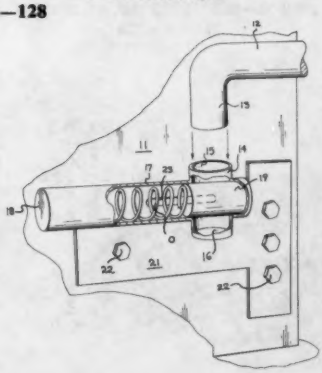


A device for attachment to coffee percolators and the like in order to prevent heat damage to the handle. This device includes a strip of metal with an asbestos sheet secured within the fold thereof and a washer of asbestos insulates the handle from the metal of the device when it is secured to the bolt at the lower portion of the handle of the percolator.

3,724,025
TELLTALE HINGE MOUNTING FOR DOORS

Hjalmar L. Hicks, Toledo, Ohio, assignor to Kenneth A. Hicks and Linda Kaye, both of Toledo, Ohio

Filed April 19, 1971, Ser. No. 135,110
Int. Cl. E05d 9/00
U.S. Cl. 16—128 **3 Claims**



A telltale hinge mounting for doors which are locked, as by padlocks in which the door can be lifted from its hinge mount-

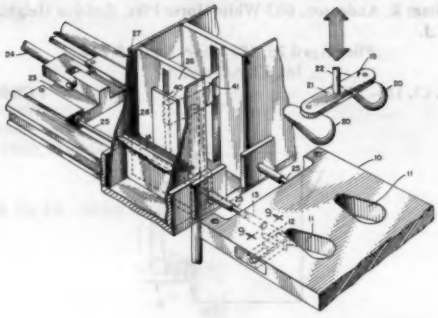
ing to afford access to the interior in the event of an emergency. Thus, entrance can be gained even though the door is locked. However, to restore the hinge to its normal useful position, a spring pressed plunger must be retracted to clear the way for the pintle and this must be done from the inside of the door. This can not be achieved with the door in locked condition, so that with the door lifted from its hinge mounting, it would at once be apparent that unauthorized entry has been had.

3,724,026

PRODUCING MOLDED MEAT STICKS

Louis E. Gernandt, Eau Claire, Wis., assignor to Armour and Company, Chicago, Ill.

Filed Oct. 30, 1970, Ser. No. 85,408
Int. Cl. A22c *7/00*
U.S. Cl. 17—1 **7 Claims**



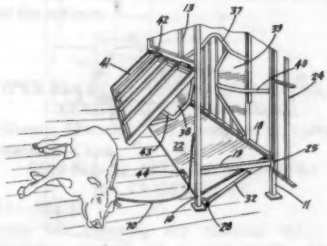
A mold plate is provided with mold recesses open at the bottom and top adapted to receive coherent meat bodies and the like, with a communicating open-bottomed slot at the end of each recess having a spring-urged closure, and sticks are pressed through the slots to open the closures and enter the meat bodies, the meat bodies with attached sticks being then discharged from the plate bottom.

3,724,027

RESTRAINING PEN

Chauncey E. Zuber, St. Louis Park, Minn., assignor to E. F. Zuber Engineering & Sales Co., Bloomington, Minn.

Filed March 27, 1972, Ser. No. 238,281
Int. Cl. A22b
U.S. Cl. 17—1 A **9 Claims**



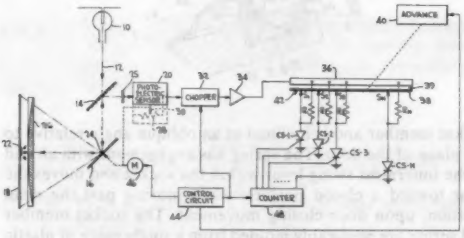
A restraining or "knocking" pen for conveniently and safely confining and restraining a livestock animal for humane slaughter. The pen is characterized by automatically locking guillotine-type restraining means for holding the head of the animal and drop-away floor and releasable side panel to free the animal from the pen after stunning.

3,724,028

METHOD AND APPARATUS FOR PHOTOELECTRIC REPRODUCTION OF CONTINUOUS RELIEF ORIGINALS

Guy Weber, Arques La Bataille, France, assignor to La Cellopane, Paris, France

Filed May 25, 1971, Ser. No. 146,626
Int. Cl. G03g *13/22, 15/22;* **H04n** *1/30*
U.S. Cl. 178—6.6 A **26 Claims**



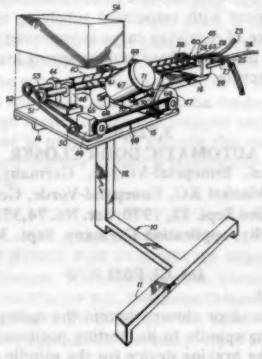
A method of photoelectrically reproducing an original or a dielectric support including scanning the original with an incident beam to provide a reflected beam having an intensity varying with relief variations of the original, converting the reflected beam into a plurality of electrical signals having varying amplitudes, and provided a plurality of electric charges on the dielectric support corresponding to the varying amplitudes of the electrical signals such that the dielectric support carries a pattern of electric charges corresponding to the relief of the original, and apparatus for effecting the above described method.

3,724,029

APPARATUS FOR KILLING POULTRY OR OTHER FOWL

Ernest E. Lewis, Flowery Branch, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.

Filed Dec. 17, 1970, Ser. No. 99,024
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **4 Claims**



This invention relates to a method and apparatus for killing chicken or other fowl suspended in a head lowermost position by making a cut or similar opening through the skull of the bird to sever the arteries going to the brain and eyes adjacent

the base of the brain. More particularly, this invention includes a pair of spaced guide means detailed for guiding and orienting the head of the fowl to be killed along a predetermined path and to a predetermined location. The spaced guide means includes rotary guiding and orienting members which are provided for advancing the neck of the fowl along the predetermined path and for moving the head to the predetermined location. The rotary guide members are provided with fluid lubricating means to permit the neck of the fowl to be moved easily through the guide means. A rotary cutting member is detailed in location relative to the predetermined path and predetermined location to make a cut or similar opening through the skull of the bird for severing the arteries going to the brain and eyes as the bird is advanced along the predetermined path. The rotary cutter means is adjustable relative to the predetermined location whereby the angular position and depth of the cutting operation can be varied.

3,724,030

TWISTABLE NOZZLE DEVICE FOR A SAUSAGE FILLING APPARATUS

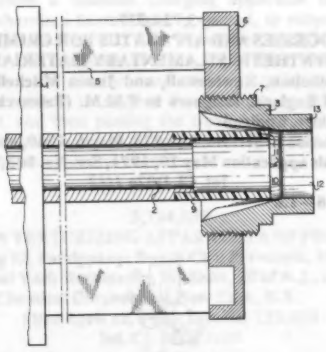
Felix Rassbach, and Rolf Buttner, both of Wiesbaden, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Dec. 29, 1970, Ser. No. 102,296

Claims priority, application Germany, Dec. 31, 1969, P 19 65 672.5

Int. Cl. A22c *11/02*

U.S. Cl. 17—41 **3 Claims**



This invention relates to an improvement in a twistable nozzle device for filling shirred sausage casings and twisting the filled casings in which the mouthpiece of the pipe of the nozzle device is made of an elastic material and is surrounded by an annular nozzle with a tapered bore whereby an annular passage is formed between the nozzle and the mouthpiece of such an adjustable width that a sausage casing fed therethrough is restrained and in which the smallest cross-section of the nozzle is at or closely ahead of the orifice cross-section of the mouthpiece of the nozzle device, the improvement comprising a passage having a length of 10 to 25 mm in the nozzle ahead of the orifice cross-section of the pipe of the twistable nozzle device, the base of which passage substantially corresponds to the outside diameter of the mouthpiece of the pipe of the nozzle device.

3,724,031

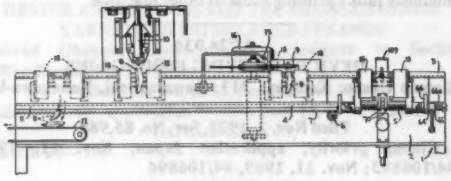
METHOD OF SHUCKING BIVALVES

G. Harris Sterling, Beaufort, and Ben P. Zober, Charleston, both of S.C., assignors to Harris Automated Machinery Co., Dover, Del.

Division of Ser. No. 763,816, Sept. 30, 1968, Pat. No. 3,605,180. This application Sept. 17, 1970, Ser. No. 73,239

Int. Cl. A22c *29/00*

U.S. Cl. 17—48 **13 Claims**



This invention pertains to shucking fresh bivalves and it encompasses both an apparatus and method which removes rapidly, and without damage, the edible portion of the bivalve. The invention consists of removing a portion of the shells of the bivalve (preferably after some of the fluids contained in the bivalve cavity have been eliminated particularly in the case of oysters), thereafter severing muscles of the bivalve which connect the meat to the shells, and finally separating the meat and the shells, and the apparatus for accomplishing the foregoing operation. The invention pertains to bivalves in general but is especially useful in the shucking of oysters and clams.

3,724,032

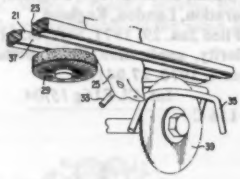
METHOD FOR KILLING FOWL

Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.

Filed April 1, 1970, Ser. No. 24,696

Int. Cl. A22c *21/00*

U.S. Cl. 17—52 **4 Claims**



A chicken or other fowl suspended in a head-lowermost position is killed by making a saw-cut or similar opening through the skull of the bird for severing the artery going to the brain and eyes thereof at the base of the brain.

3,724,033

PASTER TABS

Noel John Baker, London, England, assignor to Witton-James Limited, Wembley, England

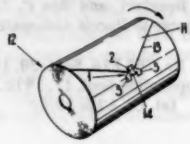
Filed May 10, 1971, Ser. No. 141,703

Int. Cl. B42f *1/00*; B65h *19/26*

U.S. Cl. 24—67 AR **5 Claims**

A paster tab for effectively securing the free end of a reel of paper, film, foil or like material to the body of the reel to prevent unwinding of the reel even when rotated at speed, but

which is shaped in such a manner that it can be readily torn away to release the end of the material on splicing it to the ex-

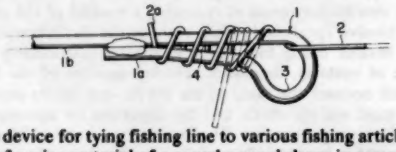


piring end of a web of similar material being fed or drawn continuously into a printing press or other machine.

3,724,034
DEVICE FOR TYING FISHING LINE

Kumao Osano, Kanigaya 313, Kawasaki-shi, Kanagawa-ken, Japan

Filed Nov. 2, 1970, Ser. No. 85,988
Claims priority, application Japan, Nov. 11, 1969, 44/106893; Nov. 11, 1969, 44/106894
Int. Cl. A01k *91/04*
U.S. Cl. 24—131 C **5 Claims**

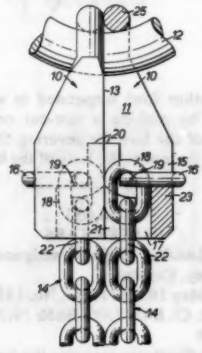


This device for tying fishing line to various fishing articles is made of a wire material of a round or oval shape in cross section and comprises a loop for putting one end of the fishing line therethrough, a quill for having an end portion of the fishing line wound therearound, and a V-shaped clip means for securely holding one end of the fishing line therein. The device makes it simple and easy to tie fishing line to various fishing articles and, in use, is capable of preventing the fishing line from being cut at that portion of the line where the tie is made.

3,724,035
CHAIN RETAINING DEVICE

Joseph Cyril Smith, Stocksbridge, England, assignor to British Steel Corporation, London, England

Filed Jan. 29, 1971, Ser. No. 110,808
Claims priority, application Great Britain, Feb. 6, 1970, 5,774/70; June 4, 1970, 27,041/70
Int. Cl. F16g *15/04*
U.S. Cl. 24—116 C **11 Claims**

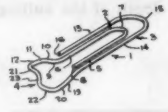


A chain securing device consists of two identical blocks connected to a crane hook ring. Each block has an opening through which chains can be passed. The openings have slot portions shaped to retain the chain ends. A chain can be inserted into the device and secured with any desired link retained in the opening so that the effective length of the chain can be adjusted at will. The chain can also easily be detached from the device.

3,724,036
PAPER CLIP

Samuel Botsford, 136 Edwards Ferry Road, Leesburg, Va.

Filed Feb. 24, 1971, Ser. No. 117,989
Int. Cl. B42f *1/02*
U.S. Cl. 24—261 PC **5 Claims**

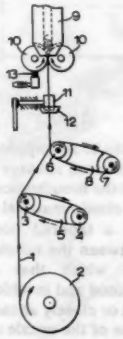


A paper clip bent from a length of wire and having U-shaped nested gripping members, with opposite legs of the gripping members being joined by a connecting member. The connecting member has an intermediate vertical offset to position the ends of the connecting member vertically spaced from, and on opposite sides of, the gripping members to permit substantial contact of the gripping members with the surfaces of paper sheaves over a wide range of thicknesses. In one form, the closed ends of the gripping members are bent toward one another to improve the gripping power of the clip. In another form, the inner gripping member consists of a single straight leg bent to form an eye at its end remote from its juncture with the connecting member.

3,724,037
PROCESSES AND APPARATUS FOR CRIMPING SYNTHETIC FILAMENTARY MATERIALS

Bruce Nicholson, Rawtenstall, and James Mitchell, Egerton, both of England, assignors to T.M.M. (Research) Limited, Lancashire, England

Continuation of Ser. No. 822,273, May 6, 1969, abandoned. This application May 10, 1971, Ser. No. 143,703
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 **12 Claims**



A process and apparatus for crimping synthetic continuous filament yarn is provided wherein the yarn is drawn in a draw zone to effect orientation of its molecules, and the yarn is

thereafter continuously fed from the draw zone to a stuffer box crimper. The drawn yarn is delivered from the draw zone at a temperature elevated by the application in the draw zone of external heat or by the action of drawing to a level to cause interfilament fusion of the yarn within the stuffer box. The drawn yarn is cooled in its passage to the stuffer box to avoid this interfilament fusion.

3,724,038

CONTINUOUS PROCESS FOR RELAXING HEAT TREATMENT AND APPARATUS THEREFOR

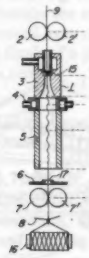
Kazuya Chimura; Takashi Kaneko; Ryuichi Nakazono; Takuma Mukai; Atushi Nakazima, and Kenichi Sakunaga, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed June 23, 1971, Ser. No. 155,722

Claims priority, application Japan, July 4, 1970, 45/58626

Int. Cl. D02g *1/00*

U.S. Cl. 28—1.2 **5 Claims**



An improvement in a continuous process for the relaxing heat treatment of crimpable filaments, particularly potentially crimpable filaments which comprises passing the filaments overfed from a filament charging apparatus through an ejecter, wherein a heated fluid is ejected, to subject the filaments to pre-heating and fiber separation, spraying a heated fluid onto the filaments at right angles from their circumference in a low tension zone under a tension as low as 1 mg/denier or less to subject the filaments to relaxing heat treatment, and then passing the treated filaments through a heat treatment chamber to subject the filaments to thermal setting, and an apparatus therefor.

3,724,039

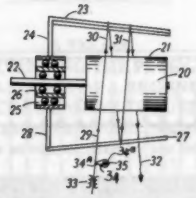
YARN TEXTURIZING APPARATUS AND PROCESS

Hsin Lang Li, Parsippany; Dusan Ciril Prevorsek, Morristown, and Noel York Rothmayer, Madison, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed April 12, 1971, Ser. No. 133,054

Int. Cl. D02g *1/10*

U.S. Cl. 28—1.5 **12 Claims**



Apparatus and process for preventing the individual wraps of yarn from entangling as multiple wraps of a continuous length of yarn is texturized at high speeds by guiding the yarn under controlled tension and temperature in frictional engagement with a texturizing element which advances in the same direction as, but at different relative speeds with respect to, the moving yarn.

3,724,040

DEVICE AND PROCESS FOR THE PRODUCTION OF YARNS WITH INTERLACED STRANDS

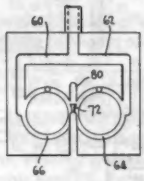
Gabriel Ohayon, Lyons, France, assignor to Societe Rhodiaceta, Paris, France

Filed June 14, 1971, Ser. No. 152,733

Claims priority, application France, June 15, 1970, 7021838

Int. Cl. D02g *1/16*

U.S. Cl. 28—1.4 **13 Claims**



A device for the production of yarns having interlaced strands which includes a first plate having a passage for the yarn therethrough; a second plate having a passage for the yarn therethrough aligned with the passage of the first plate and a surface in abutting relation to a surface of the first plate; and at least two curved conduits defined by recesses in at least one of the abutting surfaces of the first and second plates, such conduits communicating with the passages through the first and second plates. Means is provided to hold the yarn in a substantially constant position when traveling through the passages of the first and second plates and the curved conduits converge substantially tangentially toward such means to hold the yarn in place. When a rapidly moving fluid, e.g. air, is passed through the curved conduits the same impinges upon the yarn and interlaces the same.

3,724,041

PORTABLE LOOM

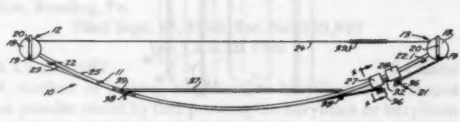
Sidney B. Cleverley, 730 Pemberton Road, Victoria, British Columbia, Canada

Filed July 26, 1971, Ser. No. 166,105

Claims priority, application Canada, Feb. 11, 1971, 105,071

Int. Cl. D03d *29/00*

U.S. Cl. 28—15 **6 Claims**



A loom having a normally straight flat springy base adapted to be bowed longitudinally for tensioning warp threads which

extend longitudinally and over ends of the base, and which are secured to a warp connecting member mounted for slidable movement longitudinally of the base, the warp being applied with the base in a bowed condition so that tendency of the base to return to its normally straight condition maintains the warp under tension.

3,724,042

APPARATUS FOR THE LAPPING OF TWO GEAR WHEELS

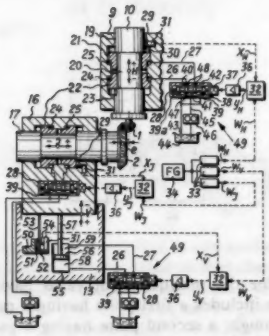
Ulrich Raess, Opfikon, and Daniel Jan, Glattbrugg, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Oct. 27, 1971, Ser. No. 193,028

Claims priority, application Switzerland, Nov. 3, 1970, 16249/70

Int. Cl. B21c *37/30*

U.S. Cl. 29—90 **5 Claims**



Apparatus for the lapping of two gear wheels which are given a lapping movement which comprises at least two oscillatory components. Apparatus comprises separate control units for the control of each component of movement. Each control unit has means for changing the velocity of the components of movement during a cycle so that the lapping movement is performed along a line of adjustable shape. The control units produce periodic voltages of the same frequency.

3,724,043

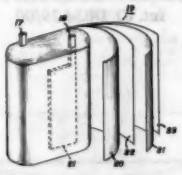
METHOD OF MAKING A CAPACITOR WITH A PREIMPREGNATED DIELECTRIC

John W. Eustance, South Glens Falls, N.Y., assignor to General Electric Company, New York, N.Y.

Continuation of Ser. No. 861,609, Sept. 29, 1969, abandoned. This application May 13, 1971, Ser. No. 143,155

Int. Cl. H01g *13/04*

U.S. Cl. 29—25.42 **13 Claims**



A liquid dielectric capacitor impregnant such as a halogenated aromatic hydrocarbon, castor oil, or mineral oil is added to finely divided polypropylene resin and thoroughly mixed therein. The resulting composition is then passed through a high temperature apparatus to produce capacitor grade polypropylene film. This film may contain the impregnant in significant amounts up to and exceeding about 20 percent by weight. An epoxide stabilizer material may also be preincorporated in the resin or added to the liquid impregnant. After a capacitor has been made with the preincorporated impregnant, the capacitor is impregnated to increase the amount of liquid dielectric therein.

3,724,044

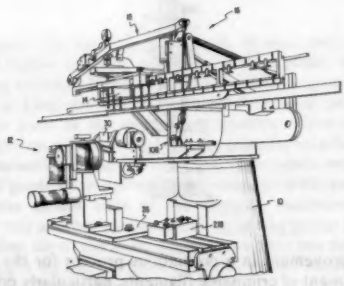
APPARATUS FOR CONDUCTING MACHINING AND/OR ASSEMBLY OPERATIONS

John A. Cupler, II, 10 Cupler Drive, LaVale, Md.

Division of Ser. No. 868,517, Oct. 22, 1969, Pat. No. 3,663,998, and a continuation-in-part of Ser. No. 715,711, March 25, 1968. This application March 4, 1971, Ser. No. 121,214

Int. Cl. B23q *3/157*

U.S. Cl. 29—26 A **5 Claims**



The disclosure is directed to a vertically oriented automatic tool changer employing non-captive tools for performing machining and/or assembly operations at a plurality of work locations on a single workpiece which workpiece is supported by a work positioner capable of infinite adjustment to present any desired number and spacing of work locations, on the workpiece, to the working axis of the non-captive tools.

3,724,045

APPARATUS FOR APPLYING PRESSURE TO AN ADVANCING WEB OF RIGID MATERIAL

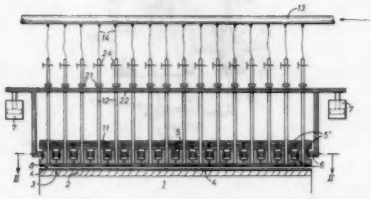
Jacques Max Charles Dryon, Auvelais, Belgium, assignor to Ateliers Heuze Malevez et Simon Reunis Societe Anonyme, Auvelais, Belgium

Filed March 9, 1971, Ser. No. 122,327

Claims priority, application Belgium, March 10, 1970, 122,327

Int. Cl. B24b *39/00*

U.S. Cl. 29—90 **8 Claims**



A device for exerting an adjustable pressure against one side of continuously moving web of a rigid strip material having the

other side thereof contacted by a surface treatment apparatus, including one or more blocks connected to a source of pressurized gaseous medium and having a plane surface in proximately spaced relationship with the first mentioned surface of the web, the surface having gas passageways therein so as to follow the formation of a gas cushion between the web surface and the block which prevents direct contact therebetween while concurrently imparting pressure to the surface of the web in the direction of the surface treatment apparatus.

3,724,046

SHAVING METHOD AND SHAVING CUTTER

Harutaka Mayuzumi, Kawasaki; Motoyuki Shinoda, Hiratsuka, and Kosuke Akizuki, Tokyo, all of Japan, assignors to Isuzu Motors Limited

Filed March 26, 1970, Ser. No. 22,835
Claims priority, application Japan, April 3, 1969, 44/25715
Int. Cl. B26d *1/12*
U.S. Cl. 29—104 **3 Claims**

A shaving method and a shaving cutter for use in carrying out a shaving operation, wherein the cutter and the gear to be processed are rotated in crossed axes relationship and the gear is shaved by one side tooth flank of a plurality of teeth formed on the circumference of the cutter.

3,724,047

INKING SLEEVE

Stanley G. Peterson, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 806,535, March 12, 1969, abandoned. This application Aug. 6, 1971, Ser. No. 169,786
Int. Cl. B21b *31/08*
U.S. Cl. 29—129.5 **4 Claims**

A polyurethane inking sleeve for assuming a tight gripping relationship with a printing roller body and thereby provide the same with a fresh inking surface. The sleeve is made by mixing millable curable polyurethane elastomer with suitable curing agent, plasticizer, and fillers, forming a sheet of a mixture, overwrapping the sheet on a suitable mandrel, curing the mixture, and grinding the resultant structure to provide a tube with a uniform wall thickness.

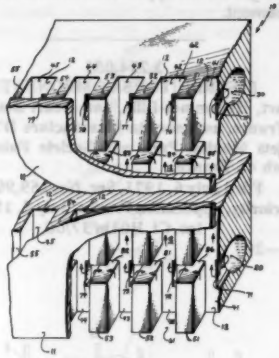
3,724,048

METHOD OF PREVENTING THE PLUGGING OF LIQUID COOLANT PASSAGES OF A REGENERATIVELY COOLED ROCKET ENGINE THRUST CHAMBER

Joe D. Duesberg, Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 16, 1971, Ser. No. 199,126
Int. Cl. B21d *53/00*
U.S. Cl. 29—157 C **4 Claims**

The liquid coolant passages of a regeneratively cooled rocket engine thrust chamber are prevented from becoming plugged by foreign particles by a method which includes the steps of forming an inlet and an outlet for each liquid coolant passage, with each inlet and each outlet so configurated and so dimensioned as to prevent the entry into the respective liquid coolant passage of foreign particles of a predetermined size and larger which would plug the liquid coolant passage.

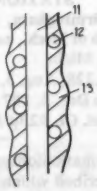


3,724,049

TITANIUM FILAMENT FOR USE IN VACUUM TECHNIQUES

Charles Biguenet, Paris, France, assignor to CSF-Compagnie Generale de Telegraphie Sans Fil, Paris, France

Continuation-in-part of Ser. No. 722,654, April 19, 1968, abandoned. This application Feb. 4, 1971, Ser. No. 112,548
Claims priority, application France, April 21, 1967, 67103754
Int. Cl. B32b *15/00*
U.S. Cl. 29—191 **1 Claim**



Filaments for vacuum devices of the titanium getter type, said filaments comprising a refractory core of tungsten, molybdenum or tantalum which is coated with a layer of pure titanium.

3,724,050

METHOD OF MAKING BERYLLIUM SHAPES FROM POWDER METAL

Edmund M. Velten, Hazleton; George J. Jagaciak, Conyngham; John N. Wambold, and Arthur Epstein, both of Mountaintop, all of Pa., assignors to The Beryllium Corporation, Reading, Pa.

Filed Sept. 19, 1968, Ser. No. 760,997
Int. Cl. B22f *1/00*
U.S. Cl. 29—182 **7 Claims**

A method of making beryllium or beryllium alloy shapes from powder metal by first pressing the beryllium or beryllium alloy shape either by isostatic pressing or conventional mechanical compacting methods at room temperature to 60 percent to 95 percent of theoretical density at a pressure of between 30,000 and 90,000 psi or above and subsequently pressing and heating to final size and density at temperatures between 1,400° F and 2,150° F (preferably 1,550° F to 1,900°

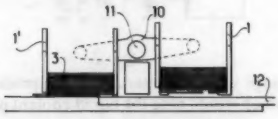
F) and pressures of from 100 to 10,000 psi effective pressure on the compacted powder, preferably at 100 to 2,500 psi. The second pressing of the shape is done with mechanical pressure simultaneously with the application of heat under vacuum or inert environment.

3,724,051

DISTRIBUTORS COMPONENTS

Rene Brocart, Hellemmes-Lille, and Henri Bourez, Lezennes, both of France, assignors to Manufacture D'Accumulateurs et D'Objets Moules, Paris and Societe Fulmen, Hauts-de-Seine, both of, France

Filed July 6, 1971, Ser. No. 159,905
Claims priority, application France, July 3, 1970, 7024810
Int. Cl. H01m *37/00*
U.S. Cl. 29—204 **4 Claims**



An assembly machine allowing the selective distribution of battery components including pairs of magazines of plates, the magazines of each of the pairs being joined and being able to oscillate, in such a way that the tappets are able to selectively drive the plates contained in one or the other of the magazines of each of the pairs.

3,724,052

OVER TRAVEL LINKAGE FOR ASSEMBLY MACHINE STATION

James T. Graham, Birmingham, and Fred W. Hackstock, Sterling Heights, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 62,228, Aug. 3, 1970, Pat. No. 3,648,346.
This application Dec. 3, 1971, Ser. No. 204,755
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P **6 Claims**

A station for an automatic nonsynchronous multistation assembly machine is described which is operated by a cam shaft extending transversely to the line of movement of the parts in the transport system, featuring an arrangement for accurately locating the members positioned by the cam mechanism.

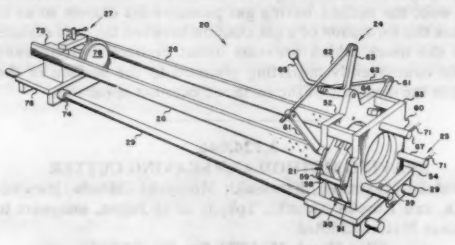
3,724,053

APPARATUS FOR PERFORMING AXIALLY-AND-RADIALLY LOCATED OPERATIONS ON TUBULAR CONSTRUCTION

Abraham M. Finkel, North Hollywood, and Michael Surwill, Burbank, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Sept. 28, 1971, Ser. No. 184,556
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—200 B **18 Claims**

An apparatus for performing axially and radially located operations on a tubular metal construction. Specifically disclosed is a crimping operation. A crimping die assembly is mounted in a suitable frame connected to a pair of guide rails along which a slidable assembly is mounted for advancing a length of tubing to the die assembly. Means are provided to open and close the die assembly in its frame. A pin assembly mechanism is connected to the slidable assembly and cooperates with a pair of established elongated pattern bars which are disposed between the die assembly and the advancing means. The mechanism's pins are caused to register with the pattern bars so as to index the advancing assembly to one station to the next, along the length of the apparatus. Thus, the spacing between crimped ring elements along the length of the



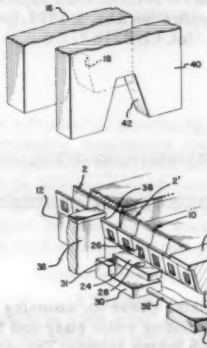
tubing is controlled, and an efficient, continuous operation is achieved. A pneumo-hydraulic pressure system is applied directly to the die assembly to actuate it in performing its crimping function.

3,724,054

MACHINE FOR FEEDING A CONTINUOUS STRIP OF ELECTRICAL CONNECTORS

Charles Henry Fernald, Oberlin, and Joseph James Chick, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 739,316, June 24, 1968, abandoned.
This application Nov. 9, 1970, Ser. No. 88,041
Int. Cl. H01r *19/04, 43/00*; **H02g** *15/00*
U.S. Cl. 29—203 D **1 Claim**



A continuous strip of U-shaped electrical connecting devices is fed to a crimping anvil to position the leading connector of the strip on the anvil preparatory to attachment to a conductor. The feed stroke is controlled by feeding the strip through a confined passageway. During each stroke of the press, a connecting device which is upstream form the confined passageway is reformed so that it can pass through the passageway. The next adjacent connector, which has not been reformed cannot pass through the passageway and limits the feed stroke.

3,724,055

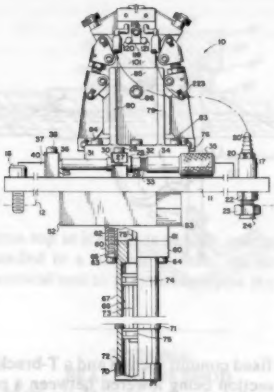
LEAD CUT AND OUTWARD CLINCH MECHANISM

Robert H. Holmes, and Albert W. Zemek, both of Binghamton, N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,267
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B **8 Claims**

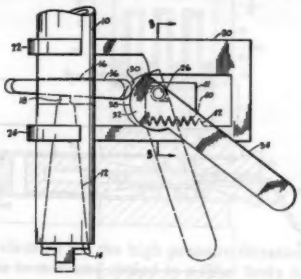
An electronic component lead cutting and outwardly clinching mechanism having a linkage arrangement whereby

the component leads are severed and outwardly clinched and the remaining portion of the lead is carried out of the cutting and clinching area by an evacuation channel. The mechanism



has a three stage linkage attached to the cutters and the outward clinch members which act, respectively, to cut and then outwardly clinch the remaining lead portion beneath a circuit board.

3,724,056
EJECTION TOOL
John Antal, 12853 Kohler Drive, Traverse City, Mich.
Filed June 16, 1969, Ser. No. 833,384
Int. Cl. B23p *19/04*
U.S. Cl. 29—253 2 Claims



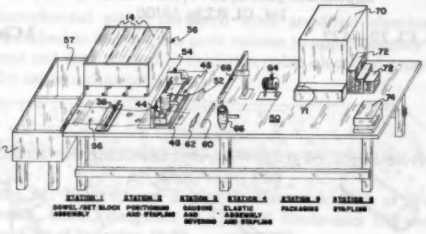
An ejection device, manually operable, for extracting tapered tools from a tapered tool receiving bore in a spindle.

3,724,057
METHOD OF MAKING VALANCES FOR LUGGAGE
Samuel J. Holtzman, Baltimore, Md., and Peter A. Cosme, Lockport, Ill., assignors to Roper Corporation, Kankakee, Ill.
Filed Oct. 6, 1971, Ser. No. 187,088
Int. Cl. B23p *17/00*
U.S. Cl. 29—416 3 Claims

The method of making extruded metal valances for luggage which includes steps of extruding male and female valance cross sections integrally edge-to-edge, welding the extrusion into a closed loop, expanding the loop to the desired size and shape, with accompanying bending, severing the extrusion at the joined lateral edges to form mating male and female valances, and then reversing the order thereof for assembling in mating relation. The procedure includes heat treating and anodizing as a preliminary step before the extrusion is cut and formed and the piercing of any necessary holes or lugs while

the extrusion is still in a single, easily handled piece and prior to severence.

3,724,058
METHOD OF MAKING COMBINED CATCHER/PROJECTOR FOR AERIAL PROJECTILES
Rulon R. Dahl, West Jordan, Utah, assignor to Killebrew, Inc., Salt Lake City, Utah
Filed June 24, 1971, Ser. No. 156,281
Int. Cl. B23p *17/00*
U.S. Cl. 29—417 10 Claims



A catcher/projector for aerial projectiles comprises a resilient mesh pocket whose peripheral confines are delimited by opposed pairs of rigid and elastic members. The rigid members comprise manually manipulatable handles while the desired pocket memory is achieved by an interweavement of the elastic members with the mesh.

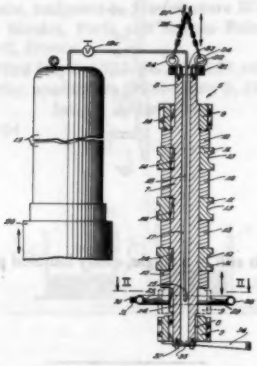
One method for making the combined catcher/projector is based on a unit-handled assemblage of closely spaced handle pairs which are secured to an indefinite length mesh at spaced locations therealong. Severance of the mesh intermediate each closely spaced pair of handles then results in a plurality of mesh connected handle pairs which are then interconnected by elongate elastic strands interweaved with the mesh. The untensioned length of the elastic strands is less than that of the mesh with which it is interweaved to define the pocket memory.

3,724,059

METHOD OF AND MEANS FOR SEPARATING INTERFERENCE-FITTED MEMBERS

Michael E. Celovsky, Bloomfield Hills, Mich., assignor to Industrial Tool Engineering Company, Detroit, Mich.

Filed Jan. 15, 1970, Ser. No. 3,021
Int. Cl. B23p *19/00*
U.S. Cl. 29—426 **41 Claims**



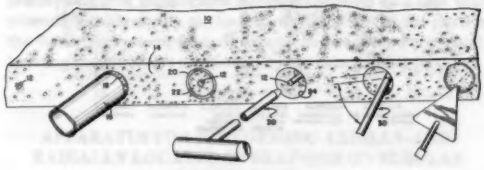
Members which have been secured in assembly by interference fit are separated by temperature differential shrinking the inner of the members and expanding the outer of the members. In a preferred manner, this is done by introducing a heat abstracting medium such as cold gas, i.e. nitrogen, to the interior of the inner member to cause it to shrink at least selectively in the area engaged by the outer member, and expanding the outer member by heating it, i.e., flame, induction, radiant.

3,724,060

METHOD OF FORM TIE REMOVAL

Joseph A. McElroy, 34 Short St., Randolph, Mass.

Division of Ser. No. 762,005, Sept. 24, 1968, abandoned. This application Jan. 8, 1971, Ser. No. 105,079
Int. Cl. B23p *19/00*
U.S. Cl. 29—427 **2 Claims**



A method wherein a small hole with sides parallel to a form tie is drilled into the concrete, a tool comprising a long rod with a tight-fitting sleeve is slipped over the stub of the tie and is rocked within the confines of the hole until the stub tie breaks off, and the hole is patched without feather edges.

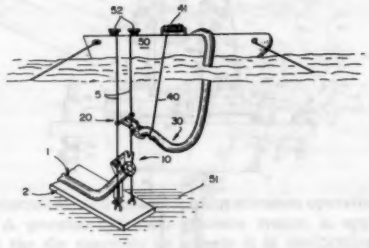
3,724,061

METHOD AND APPARATUS FOR PIPELINE CONNECTION

Dirk A. Schipper, P.O. Box 28, Tapline, Sidon, Lebanon

Filed July 7, 1971, Ser. No. 160,309
Int. Cl. B23q *3/00*
U.S. Cl. 29—464 **9 Claims**

A method and apparatus for aligning the mating surfaces of two sections of fluid conduit that are to be joined, one section of which is lowered from a position above the other, and for maintaining this aligned configuration of the mating surfaces until the joining of the aligned sections can be accomplished. The method and apparatus involves the use of notched plates



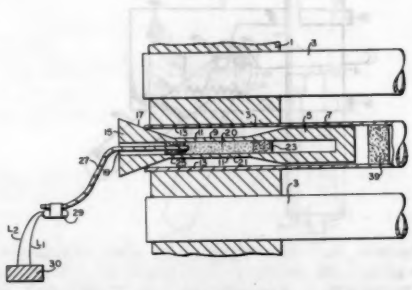
attached to the fixed conduit section and a T-bracket attached to the conduit section being lowered between a pair of fixed guidelines, which T-bracket engages with the notched plates and guides the mating surface of the conduit section being lowered into mating alignment with the fixed conduit section.

3,724,062

EXPLOSIVELY WELDED PLUG FOR LEAKY TUBES OF A HEAT EXCHANGER AND METHOD OF USING THE SAME

Roger E. Cantrell, and Louis A. Sturiale, both of Tampa, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 18, 1971, Ser. No. 125,514
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 **10 Claims**



A plug for a leaky tube of a heat exchanger, the plug being weldable to the leaky tube by a shock wave propagated by an explosive charge disposed within the plug and a method of plugging a leaky tube by explosively welding the plug to the leaky tube.

3,724,063

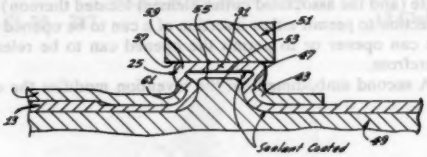
METHOD OF MAKING RIVETED JOINT

Omar Brown, Kettering, Ohio, and George F. Smyth, Los Angeles, Calif., assignor to Ermal C. Fraze, Dayton, Ohio

Division of Ser. No. 881,408, Dec. 2, 1969, Pat. No. 3,637,106. This application May 10, 1971, Ser. No. 141,574
Int. Cl. B21d *39/00*; B23p *11/00*
U.S. Cl. 29—509 **5 Claims**

A container wall having a tear portion attached to a tab by a hollow rivet which is formed in the tear strip and which ex-

tends through an aperture in the tab. The sheet material around the aperture is deformed outwardly with a liberal radius of curvature to form a boss which terminates in an annular end face forming a conical seat. The end face slopes

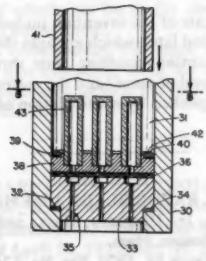


toward the can top as it extends radially inwardly. The hollow rivet is expanded in a manner to form the head of the rivet against the conical seat to permanently join the tab to the container wall.

3,724,064
SEALING METHOD

Lambert H. Mott, c/o Mott Metallurgical Corp., P.O. Drawer "L" Farmington Industrial Park, Farmington, Conn.

Continuation-in-part of Ser. No. 215,458, Jan. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 51,884, July 2, 1970, abandoned. This application May 3, 1972, Ser. No. 249,967
Int. Cl. B21d *39/00*; B23p *11/00*
U.S. Cl. 29—520 **9 Claims**



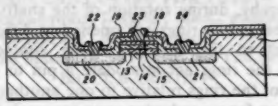
A filter element for the high pressure filtration of synthetic polymers is locked and sealed in a filter body by providing a peripheral shoulder in the filter element and a soft metal rim seated in the peripheral shoulder, the rim having a longitudinal corrugation which is flattened to radially expand the rim inward and outward to lock and seal the filter element in the filter body. A hard metal locking rim may be used to provide a seal if a means is provided to maintain a pressure on the rim to flatten its corrugation and expand it inward and outward. Other elements may be sealed by the method of this invention.

3,724,065
FABRICATION OF AN INSULATED GATE FIELD EFFECT TRANSISTOR DEVICE

Bernard G. Carbajal, III; William Milton Gosney, both of Richardson, and Lou H. Hall, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 1, 1970, Ser. No. 77,222
Int. Cl. B01j *17/00*
U.S. Cl. 29—571 **16 Claims**

An insulated gate field effect transistor is fabricated by a sequence of steps beginning with the growth and patterning of a thick oxide layer on an n-type silicon wafer. A thin gate-dielectric film is then formed on the exposed silicon surface, followed by deposition and patterning of the gate electrode thereon. The excess gate dielectric is removed, using the elec-

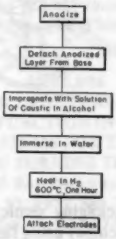


trode as an etch resistant mask, and the wafer is then covered with a boron-doped silane oxide diffusion source for the formation of p-type source and drain regions. The resulting self-aligned and passivated-gate structure is then provided with ohmic contacts to complete the device.

3,724,066
LIGHT AMPLIFIERS

Eugene Wainer, Shaker Heights; Selwyn H. Rose, Beachwood, and Theodore M. Harkulich, Chagrin Falls, all of Ohio, assignors to Horizons Incorporated, a Division of Horizons Research Incorporated of Ohio, Cleveland, Ohio

Division of Ser. No. 764,370, Sept. 20, 1968, Pat. No. 3,626,233. This application July 19, 1971, Ser. No. 165,827
Int. Cl. B23p *17/04*
U.S. Cl. 29—592 **11 Claims**

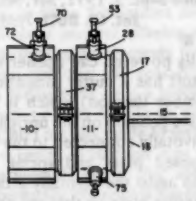

Anodize
Detach Anodized Layer From Base
Impregnate With Solution Of Caustic In Alcohol
Immerse In Water
Heat In H_2 600°C, One Hour
Attach Electrodes

Microchannel plates prepared from anodized aluminum layers etched to increase the pore volume to approximately 50 percent and then treated to exhibit suitable electrical properties for use as a channel plate.

3,724,067
METHOD OF ASSEMBLING A SWITCH BY THE USE OF AN ALIGNING PIN

Charles M. Tygard, and James H. Cameron, both of West Covina, Calif., assignors to Spectrol Electronics Corporation, City of Industry, Calif.

Division of Ser. No. 828,617, May 28, 1969, Pat. No. 3,585,562. This application June 1, 1970, Ser. No. 54,045
Int. Cl. H01h *11/00*, *11/02*
U.S. Cl. 29—622 **2 Claims**



A combined potentiometer and switching structure including wiper contacts fixed to a shaft and having contacting en-

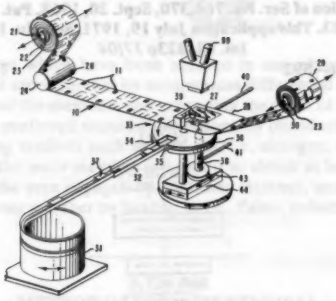
gagement with an annular resistor and a pair of switching rings. The wiper contacts are located coincident, or in phase relation. The switching rings are each provided with an interrupted area, such areas are located in an arc complemental to the arc of the resistor and are circumferentially spaced apart a distance not greater than the length of the resistor contacting surface whereby, during rotation of the shafts, circuits connected to the switch rings are opened at different positions with respect to the resistor wiping contact. Alignment openings in the rings accommodate a pin to permit proper positioning of the rings relative to one another and also provide a passage for a conductor upon removal of the pin once the rings are properly positioned and secured against displacement.

3,724,068

SEMICONDUCTOR CHIP PACKAGING APPARATUS AND METHOD

Richard J. Galli, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1971, Ser. No. 118,805
Int. Cl. H05k *3/30*
U.S. Cl. 29—626 **21 Claims**



An apparatus for packaging semiconductor device chips (e.g., integrated circuit chips) using flexible transparent carrier strips having metallizations thereon. This apparatus accomplishes inboard bonding of the active face of the chip to the carrier metallizations, die bonding of the nonactive face of the chip to the substrate, and outboard bonding of the carrier metallizations to substrate metallizations, to form a package. Also, an apparatus for the inboard bonding step, as well as an apparatus for die and outboard bonding. Continuous automated bonding at high rates is possible using this apparatus. Also, a method for packaging chips.

3,724,069

ELECTRIC CAN OPENER WITH REMOVABLE CUTTER MOUNTING PLATE AND PIVOTALLY ATTACHED HAND LEVER

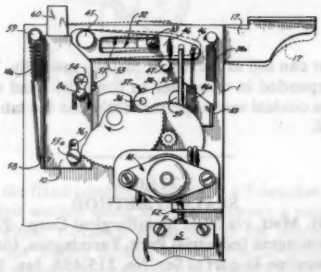
Robert E. McLean, Raytown, Mo., assignor to Rival Manufacturing Company, Kansas City, Mo.

Filed Sept. 3, 1971, Ser. No. 177,688
Int. Cl. B67b *7/38*
U.S. Cl. 30—4 R **10 Claims**

An electrically powered can opener with power-pierce and automatic shutoff has a cutter mounting plate (carrying the can cutter member thereon) which is selectively removable from its operative position on the upright can opener frame. A hand lever is pivotally connected to the cutter mounting plate with an interposed plate and spring combination located therebetween to assist the pivotally attached lever in moving the cutter mounting plate so that the cutter member and can feed wheel are either appropriately separated or brought into an operative position for piercing and severing the end from the can. The can opener frame has a movable can guide extending therefrom which cooperates with a fixed can guide extending from the cutter mounting plate to assist in initiating the power-pierce and automatic shutoff. A portion of the cutter mounting plate assists in the movement of the movable can guide. The hand lever has a surface for contacting a cutter mounting plate mating surface to pivot the cutter mounting plate (and the associated cutter element located thereon) in a direction to permit either insertion of a can to be opened into the can opener or to permit the opened can to be released therefrom.

A second embodiment of the invention modifies the construction of the cutter mounting plate so that the upward swinging of the pivotally mounted hand lever is not resisted by the spring force of the movable can guide as the lever is swung upwardly. This latter feature eliminates the tendency to tilt or to rotate the entire can opener when the hand lever is so swung.

Both embodiments of the invention include a spring biased push button operated latch which engages the pin member extending from the cutter mounting plate through the upright frame so that removal of same (and the cutter member carried thereon) is accomplished by manipulation of the push button latch.

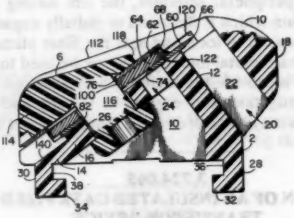


3,724,070

DUAL RAZOR BLADE ASSEMBLY

Francis W. Dorion, Jr., Hingham, Mass., assignor to The Gillette Company, Boston, Mass.

Filed March 15, 1971, Ser. No. 124,068
Int. Cl. B26b *21/06, 21/22*
U.S. Cl. 30—47 **20 Claims**

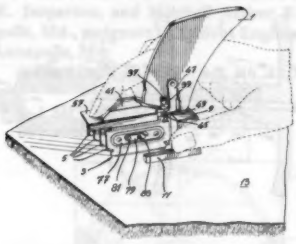


A razor blade assembly including a platform member connected to a cap member with blade means disposed therebetween. The blade means comprises a plurality of blade members having cutting edges extending in the same direction, whereby in a shaving operation all the cutting edges are utilized substantially simultaneously.

3,724,071
CUTTING TOOL FOR PELTS OR THE LIKE

Horace Hurtubise, 3256 rue Allard, Ville Emard, Quebec, Canada

Filed Feb. 1, 1971, Ser. No. 111,374
Int. Cl. B26b *29/00, 3/04*
U.S. Cl. 30—287 12 Claims



Tool for cutting fur pelts, sheets of leather, or the like, into narrow strips and formed of a handle to which block of cutting blades is removably fixed. The blades are removably secured to a body in spaced parallel relationship; the spacing between blades being equal to the desired width of the strips.

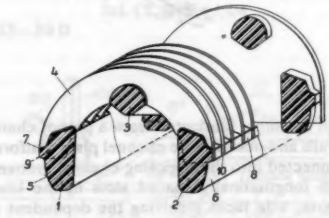
In a first embodiment, the blades are secured to the body in such a manner that the cutting tips lie in a line that extends obliquely with respect to the longitudinal axis of the blade block, that is at an angle less than 90° with respect to the direction of cutting. In this embodiment, the blade block is removably mounted on the handle by being clamped between two jaws, one of which can be bodily displaced toward the other in clamping engagement.

In the second embodiment, the blade body is removably mounted on an arm extending from the handle, being held thereto by a spring biased locking pin removably received in a T-shaped slot of the body.

3,724,072
SHEARHEAD FOR DRYSHAVERS

Werner Messinger, Kronberg, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt an Main, Germany

Filed April 16, 1971, Ser. No. 134,682
Claims priority. application Germany, April 23, 1970, P 20 19 744.8
Int. Cl. B26b *19/04*
U.S. Cl. 30—346.51 7 Claims

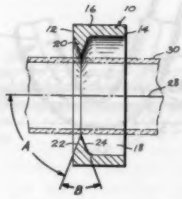


An elongated mounting body of a shearhead for dryshavers has opposite lateral side faces. A plurality of cutter blades are mounted on the mounting body straddling the same transversely of its elongation and having free edge portions which project laterally beyond the side faces thereof. Ribs are provided on and laterally project from the respective side faces and each surround and embed one of the edge portions of the respective cutter blades.

3,724,073
ANNULAR CUTTER FOR TUBING

Stephen H. Lewandowski, Decatur, Mich., assignor to Hamilton Alloy Products, Inc., Decatur, Mich.

Filed March 10, 1971, Ser. No. 122,767
Int. Cl. B23d *21/04*
U.S. Cl. 30—347 4 Claims

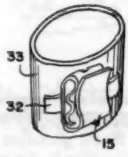


A cutter for tubing which is adapted for use in a machine which imparts circular-oscillative movement to the cutter. The cutter includes a bore through which the tubing is inserted and an annular V-shaped cutting part which protrudes into the bore and which, upon movement of the cutter, causes the tubing therein to be separated into selected lengths. The annular cutting part of the cutter is continuous and is defined by converging first and second faces each extending at an acute angle to the axis of the cutter bore.

3,724,074
BRACKETS FOR SUPPORTING ARCH WIRES, AND ADAPTED TO FUNCTION IN ORTHODONTIC PROCEDURES IN SYSTEMS FOR TILTING, UPRIGHTING AND TURNING TEETH

Melvin Wallshein, 8645 Bay Parkway, Brooklyn, N.Y.

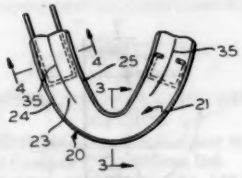
Filed Feb. 22, 1971, Ser. No. 117,556
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A 14 Claims



The brackets are made of resilient strip material bent in sinuous, convolute or tortious formations to include bight-joined flights one in front of another offering a plurality of V-clamp structures with transverse channels for arch wires of various sizes and cross-sections; the rear flight being fixed onto a band which is for tight fit onto a tooth. The channels may have fulcrum teeth or teats to grip an arch wire against movement therealong and may be made to serve to aid a slight tilting movement of a tooth. A fulcrum may be provided by having a narrow intermediate flight. For appreciable tilting and uprighting of a tooth, the channel is flared from a central region to have the form of the longitudinal half of an hour-glass shape, thus providing a fulcrum and clearance for arch wire movement in a vertical plane. The bracket is also adaptable to move a tooth a part turn about its longitudinal axis. The

V-clamps function cumulatively, offering high clamping action. The flights may have transverse dents for tie wires.

3,724,075
UNIVERSAL TOOTH POSITIONING AND RETAINING APPLIANCE
Peter C. Kesling, Green Acres, LaPorte, Ind.
Filed March 8, 1971, Ser. No. 121,771
Int. Cl. A61c 7/00
U.S. Cl. 32—14 B **14 Claims**

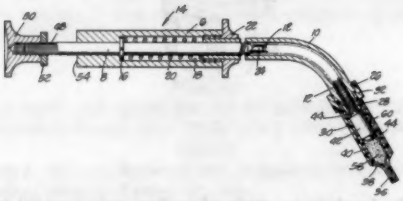


An orthodontic appliance for use in the final stages of orthodontic treatment to ideally position and retain teeth, which comprises an arch-shaped body of resilient material having upper and lower archways for receiving the upper and lower arches of a patient, and seating springs anchored to the body for engagement in embrasure areas to maintain the appliance in place and cause closing of teeth spaces. The appliance is premolded in several sizes, and the seating springs are custom fitted to the patient's arches in a short period of time by the orthodontist, thereby eliminating the usual wait for a custom molded appliance produced from impressions of the patient's teeth.

ERRATUM

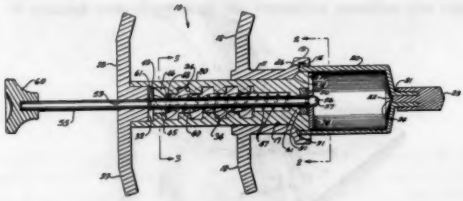
For Class 32—19 see:
Patent No. 3,724,099

3,724,076
DENTAL CEMENT GUN
William L. Schmitz, San Marino, Calif., assignor to Vac-O-Cast, San Marino, Calif.
Filed April 5, 1971, Ser. No. 130,943
Int. Cl. A61c 5/04
U.S. Cl. 32—60 **3 Claims**



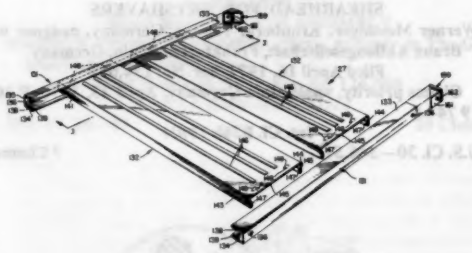
A device for forcing or expressing dental cavity filling materials into tooth cavities wherein the materials are incompatible with metals or will objectionably adhere thereto and wherein those portions of the device are not contacted by the dental filling materials desirably are of metal, and those portions which are located within the filling materials and from which said materials are forced or expressed into the cavities, are of plastic or similar substances unaffected by the dental filling materials; the device including structure simplifying the charging thereof with the filling materials and also being constructed to utilize as much of said filling materials as possible without waste due to the expense of said filling materials.

3,724,077
MIXING SYRINGE
Leonard A. Preston, Monrovia, and Seymour J. Shriver, Glendora, both of Calif., assignors to Unitek Corporation, Monrovia, Calif.
Filed Nov. 26, 1971, Ser. No. 202,089
Int. Cl. A61c 5/04
U.S. Cl. 32—60 **12 Claims**



A syringe for mixing and dispensing compounds or mixtures such as dental impression materials. Components of the material to be mixed are placed in a disposable cup which is attached to the syringe. A plunger knob on the syringe is next repeatedly depressed against a return spring to drive a rotating slotted mixing plate back and forth through the material to effect mixing. A pair of handles on the syringe are then squeezed toward each other to force the mixed material out of a nozzle on the cup.

3,724,078
LOCK JOINT FOR FABRICATED PLATFORM ASSEMBLIES
Edward T. Carlin, and Bobby L. White, both of Shreveport, La., assignors to Gym-Dandy, Inc., Bossier City, La.
Division of Ser. No. 863,603, Oct. 3, 1969, Pat. No. 3,601,397.
This application Feb. 18, 1971, Ser. No. 116,683
Int. Cl. E04f 11/16; E04c 2/30
U.S. Cl. 52—177 **6 Claims**



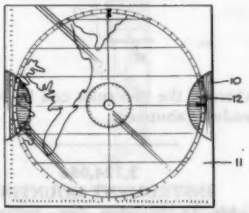
A platform assembly fabricated from a pair of channel-like supporting rails and one or more channel plate platform members end connected into the opposing channel grooves of the rails through longitudinally spaced slots in the lower rail, channel groove, side faces receiving the dependent channel plate side flanges and upstanding, button punched, protuberances formed at the opposite ends of the channel plate main body to interlockingly engage with the upper rail, channel groove, side faces. A positive interlock and smooth rounded exposed flange edge construction is secured by return bending the free flange edges of both the rails and channel plate platform members upon themselves so the spaced rails slots can be formed in the return bent portions of the lower rail, channel groove, side faces and the upstanding protuberances may

be cammingly engaged with the return bent portions of the upper rail, channel groove, side faces during endwise entry of the channel plate ends into the rail channel grooves to final home position with the protuberances end butted with the terminal ends of the return bent portions of the upper rail, channel groove, side faces.

3,724,079
NAVIGATIONAL CHART DISPLAY DEVICE

Robert E. Jasperson, and Mitchell Arthur Kapland, both of Annapolis, Md., assignors to Trident Engineering Associates, Inc., Annapolis, Md.

Filed Sept. 23, 1970, Ser. No. 74,702
Int. Cl. G03b *21/00*
U.S. Cl. 33—1 SD **3 Claims**

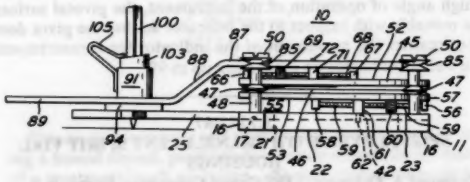


A navigational chart display device which is adapted to enable a pilot to fix his position, to plot courses and to measure distances. The device is constituted by a stationary board having printed within a circular zone on the face thereof a Mercator projection of a selected region, the zone being encircled by a true compass rose. Within the true compass rose and concentric therewith is a magnetic variation rose. Superposed on the chart board is a transparent writing panel, and sandwiched therebetween is a transparent disc which is pivotally mounted for rotation about the zone center of the chart. The disc is provided with orthagonally-crossed diameter lines ruled thereon, which lines terminate in pointers and are adapted to indicate angular positions with respect to the true compass rose, the disc also having an array of equi-spaced grid lines ruled thereon in parallel relation to one of the diameter lines. The grid lines on the rotatable disc serve to plot bearings, lay off courses, plot latitude and longitude coordinates and to measure distances, these procedures being carried out by drawing erasable lines on the writing board.

3,724,080
ELLIPSE COMPASS

Leslie Kane, Philadelphia, Pa., assignor to Kane and Sullivan, Inc., Mechanicsville, Pa.

Filed May 3, 1972, Ser. No. 249,875
Int. Cl. B43l *11/04*
U.S. Cl. 33—30 D **9 Claims**

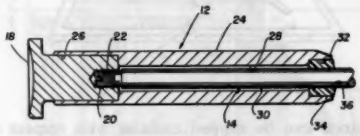


An ellipse compass is provided that has a base plate, a top plate, an intermediate plate, and rotatable disc therebetween with pins adjustable as to their positions engaged in the top plate and intermediate plate such that relative motion is obtained therebetween to permit drawing of ellipses, and which may include a gauge to determine the setting of the minor axis dependent on the size of the major axis.

3,724,081
DENTAL INSTRUMENT

John C. Windecker, 355 Wheatley Road, Old Westbury, N.Y., and William Hayman, 53 Woodland Drive, Oyster Bay Cove, N.Y.

Filed Sept. 7, 1971, Ser. No. 178,257
Int. Cl. A61c *3/00*
U.S. Cl. 32—40 R **4 Claims**

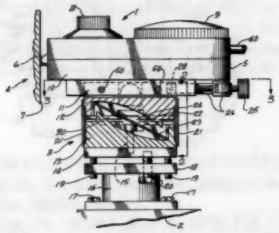


A dental instrument having its gripping end centered in an oversized internal bore of its handle so that there is minimal amount of vibration transmitted to the handle.

3,724,082
FLEXURE MOUNTING FOR FRICTION-WHEEL MEASUREMENT DEVICE

Irven H. Culver, Playa del Rey, Calif., assignor to Primus Mfg. Inc., San Lorenza, Puerto Rico

Continuation-in-part of Ser. No. 9,872, Feb. 9, 1070, abandoned. This application Aug. 27, 1970, Ser. No. 67,379
Int. Cl. G01b *3/12*
U.S. Cl. 33—141 E **19 Claims**



A mounting and biasing mechanism for maintaining an essentially constant tracking force between a frictionally driven distance measuring metering wheel and a measurement surface, along which the wheel rolls in use, is described. An end-loaded leaf spring of desired stiffness provides the desired tracking force, and is preloaded and predeflected as a slender column so that the wheel follows undulations of the measurement surface with essentially no change in the force applied by the spring to the wheel.

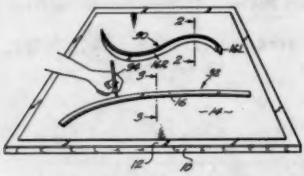
3,724,083
MAGNETIC STRIP DRAFTING INSTRUMENT

Charles W. Mehl, P.O. Box 728, Redlands, Calif.

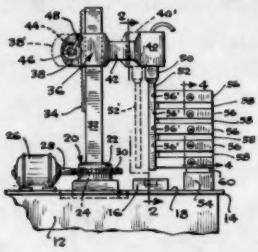
Filed April 17, 1970, Ser. No. 29,427
Int. Cl. B43l *13/20*
U.S. Cl. 33—177 **1 Claim**

An instrument comprising two or more elongated flexible strips of plastic having magnetic properties such that when the strips are in a first position relative to one another, they overlap their full widths and cling together to form a multiple thickness assembly; and in a second position with the ends of one strip reversed relative to the other, they overlap only half

widths. In the first position, the strips form a laminated flexible drafting spline which adheres to a sheet-steel-faced board underlying a sheet of drawing paper. There are measurement graduations and indicia along the edges and the two overlapping strips can be slipped endwise with respect to one another to form an extensible measuring tape for measuring distances along curved lines. Strips with logarithmic graduations can be used in said second position to form a slide rule.



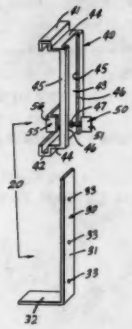
3,724,084
ALIGNMENT APPARATUS
Leonard D. McNeece, 1913 Saint Charles Road, Maywood, Ill.
Filed Sept. 28, 1970, Ser. No. 75,941
Int. Cl. B27g *23/00*
U.S. Cl. 33—185 R **1 Claim**



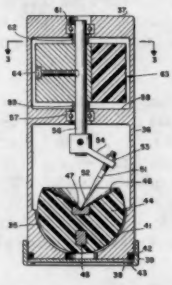
An apparatus comprising a probe element for aligning and for checking the alignment of a tool, or the like, with respect to a work piece. The tool is moved into engagement with the probe element thereby activating indicators which are provided on the probe to provide a manifestation of alignment or mis-alignment. Once the tool, or other element, has been aligned it usually will maintain this condition during a normal period of use.

3,724,085
DRAPERY ROD INSTALLATION TEMPLATE
Henry C. Wentworth, 948 Pine Street, Muskegon, Mich.
Filed Feb. 16, 1971, Ser. No. 115,231
Int. Cl. B25h *7/00*
U.S. Cl. 33—189 **12 Claims**

This drapery template includes a flat, elongated rule, having a linear rib projecting rearwardly from the rear face of the rule so that it can be hung on a window casing. There are a plurality of regularly spaced markings along the length of the rule whereby the distance of one end of the rule from the vertical edge of a window casing can be determined. Near the same end of the template, there are a pair of vertically spaced drill guide fixtures extending through the body of the rule. A pair of casement brackets can be slidably mounted on the rule such that it can be used in conjunction with a casement window. A second similar rule, with drill guide fixtures located at the opposite end from the drill guide fixtures of the first rule includes a bracket whereby the two rules can be releasably engaged together in endwise abutment.



3,724,086
INSTRUMENT MOUNTING
Henry P. Lichte, Jr., Houston, Tex., assignor to Sperry Sun Well Surveying Company, Sugar Land, Tex.
Continuation of Ser. No. 778,491, Nov. 25, 1968, abandoned.
This application April 6, 1970, Ser. No. 26,044
Int. Cl. G01c *17/02*
U.S. Cl. 33—304 **16 Claims**



The particular embodiment described herein as illustrative of one form of the invention utilizes, in an instrument for lowering into a wellbore, an indicator device mounted in an inverse position in the instrument for measuring angular parameters of the wellbore, and a camera unit for recording the indicator measurements. The indicator is positioned above the camera in a fluid environment and on a pivotal surface with the indicator face pointing down. In order to permit a high angle of operation of the instrument, the pivotal surface is movable with respect to the indicator so that the pivot does not restrict the movement of the indicator for measurements in wellbores having an inclination up to 90°.

3,724,087
SPIRIT LEVEL WITH TRANSLUCENT SPIRIT VIAL HOUSINGS
Seymour A. Ostrager, 1188 Grand Concourse, Bronx, N.Y.
Filed Oct. 26, 1970, Ser. No. 84,040
Int. Cl. G01c *9/32, 9/30*
U.S. Cl. 33—348 **9 Claims**

A spirit level of elongated structure for determining plumb and horizontal orientations having spirit vial units at longitudinally spaced intervals thereof is provided. The spirit level frame comprises an elongated channel having parallel side

walls and a connecting web extending perpendicularly between the side walls. The side walls form a recess which is adapted to receive the spirit vial units. At least one of the spirit vial units has a pair of spirit vials disposed perpendicularly to each other to permit simultaneous reading of both spirit levels to determine plumb. The spirit vial unit has a translucent

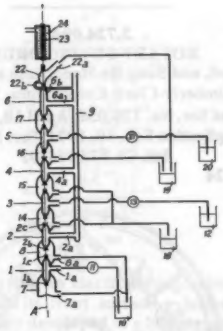
housing for maintaining the vials in the recess. The housing has a transparent window to enable simultaneous reading of both the vials from a lateral position. The remaining portion of the translucent housing facilitates ease of reading by providing additional light to the vials while preventing the viewer from confusing other structure within the housing with said vials.

3,724,088

PROCESS USING SHOCK WAVES FOR THE CONTINUOUS TREATMENT OF THREADS

Michel S. M. Lefebvre, Saint-Ouentin, and Jean-Claude M. L. Hennion, Arly, both of France, assignors to Omnium De Prospective Industrielle, Saint-Quentin, France

Filed Jan. 18, 1971, Ser. No. 107,166
Claims priority, application France, Jan. 21, 1970, 7002183
Int. Cl. F26b *5/04*
U.S. Cl. 34—16 **6 Claims**



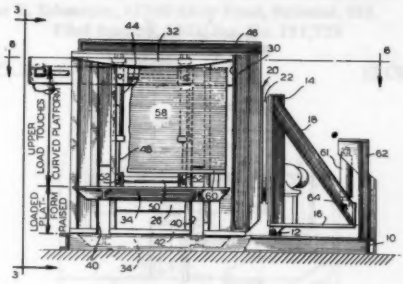
This invention relates to a process for squeezing and/or drying a humid thread, particularly a textile thread, in the course of a treatment, such as dyeing, effected continuously on said thread during the rectilinear displacement thereof, wherein the humid thread is passed into a zone traversed by a current of air at a pressure much lower than the pressure prevailing about the thread during the operation having provoked it humidification. The invention also relates to an apparatus for continuously treating a thread, for example a textile thread, applying the process as described hereinabove.

3,724,089

SHEET WINDING, TURNING AND ALIGNING METHOD AND APPARATUS

Gene C. Thompson, Hollis Center; Joseph W. Radomski, Saco, and David E. Wilson, Cumberland Center, all of Maine, assignors to Southworth Machine Company, Portland, Maine

Continuation-in-part of Ser. No. 147,944, May 28, 1971, Pat. No. 3,680,220. This application Dec. 2, 1971, Ser. No. 204,252
Int. Cl. F26b *3/04*
U.S. Cl. 34—23 **18 Claims**



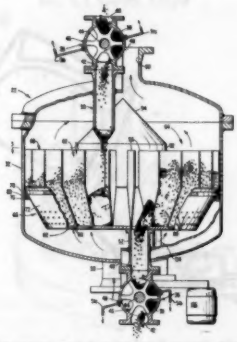
A sheet winding, turning and aligning method and apparatus for printed paperboard sheets and the like wherein a stack of horizontal sheets comprising the stack are rotated in the vertical plane while being confinedly supported, beyond 90°, with the boards being projected against a curved plate to implement breaking any ink pack which may be in a load due to movement of the sheets against one another and to provide enhanced column strength to prevent a tendency of the board slipping to the bottom of the pile as retaining jaws of the turner are opened, with resultant bottom edge pressure preventing proper winding or aeration, the boards or sheets comprising the load subsequently being tilted by the device to dispose the bottom and side edges at an angle from the horizontal and the vertical planes and vibrating and aerating the bottom and side edges of said sheets when so tilted to align sheet edges.

3,724,090

APPARATUS FOR PROCESSING PARTICULATE SOLIDS

Horace L. Smith, Jr., Richmond, Va., assignor to Smitherm Industries, Inc., Richmond, Va.

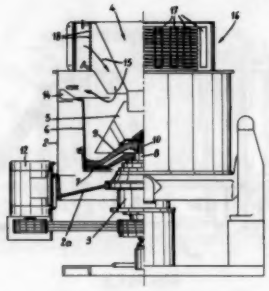
Division of Ser. No. 44,464, June 8, 1970, Pat. No. 3,615,668. This application Nov. 3, 1970, Ser. No. 86,457
Int. Cl. F26b *17/22*
U.S. Cl. 34—57 D **11 Claims**



Apparatus for processing particulate solids in a continuous operation, which includes a reactor, a system for heating and circulating a fluid through the reactor, and arrangements for

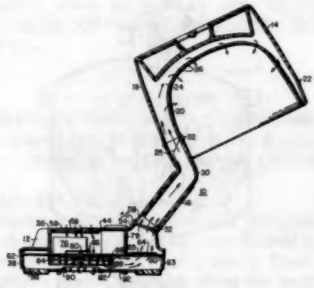
continuously supplying material to be processed to and discharged from the reactor.

3,724,091
CONTINUOUS PRODUCTION CENTRIFUGE
Joseph Antoine Noel Rousselet, Montalivet, Annonay, France
Filed May 11, 1971, Ser. No. 142,248
Int. Cl. F26b *17/30*
U.S. Cl. 34—58 **7 Claims**



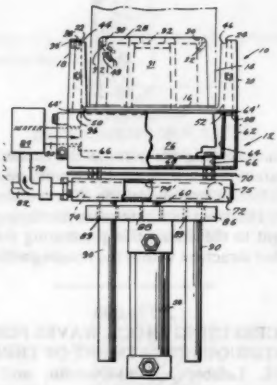
In a continuous-production centrifuge comprising a loading hopper, a material distributing cone, a material receiving perforated basket and a push-pan housed in the bottom of said basket and adapted to be moved in the axial direction thereof for pushing the dried material towards the free edge of said basket, this assembly is disposed centrally of a fixed tank and characterized in that this tank comprises a tangential outlet orifice located at the level of the free edge of said perforated basket, this edge comprising blades adapted to direct the dried material towards said outlet orifice and to create an air current for pneumatically transferring the material, adequate collecting means being provided on the outer side of said orifice; the kinetic energy of the material is utilized for projecting same tangentially towards said outlet orifice, means being provided for adjustably heating the air or gas introduced into the tank of the machine and partaking in the transfer of said material, in order to accelerate the drying of said material.

3,724,092
PORTABLE HAIR DRYER
Earl W. McCleerey, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 12, 1971, Ser. No. 161,667
Int. Cl. A45d *20/00*
U.S. Cl. 34—99 **4 Claims**



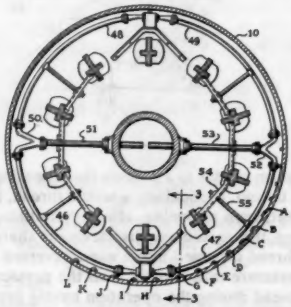
A portable hair dryer having a base generally comprising a molded casing housing a motor and centrifugal fan assembly, a heater element, air inlet openings for receiving ambient room air and delivering it to a duct connected to an air chamber having a plurality of outlet openings and contoured to receive the head of hair to be dried. The centrifugal fan is characterized by a plurality of radially extending upper blades and lower blades separated by an intermediate plate. The air inlet includes an upper opening in the casing for air delivery to the upper blades and a lower opening for air delivery to the lower blades with the air expelled by the fan into a fan chamber directing it to a generally enlarged duct to substantially increase the capacity of the fan and the volume of air delivered to the hair.

3,724,093
HEATER FOR SEALING CARTON CONTAINERS
Howard E. Olila, St. Paul, Minn., assignor to Haskon Incorporated, Warsaw, Ind.
Filed Oct. 30, 1970, Ser. No. 85,805
Int. Cl. F26b *25/00*
U.S. Cl. 34—104 **13 Claims**



A heating apparatus for use with a carton forming machine for selectively heating the sealing surfaces of carton closure elements. A hot air distributor head is formed to receive the closure elements of the carton in adjacent relationship and to selectively heat portions of the closure elements by convection and radiation.

3,724,094
ROTARY DRYING DRUM
David W. Appel, and Sung Ho Hong, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Continuation of Ser. No. 720,055, April 10, 1968, abandoned.
This application Feb. 16, 1971, Ser. No. 115,815
Int. Cl. F25d *11/02*
U.S. Cl. 34—124 **12 Claims**



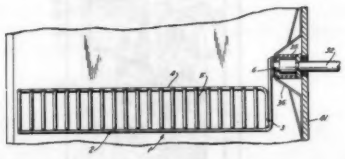
A rotatably mounted cylindrical drier drum having a steam supply connection for directing steam into the drum and a

condensate removal connection for removing condensate out of the drum, the drum being provided with a plurality of bars extending lengthwise of the drum and disposed on the internal surface of the drum for giving turbulence to the condensate in the drum, with the bars being spaced from each other from a spacing of 2.5 inches to a spacing of 7.4 inches with each of said spacings being multiplied by $d/2.2$, where d is the internal diameter of the drum in feet.

3,724,095
DELICATE GOODS TRAY

Terry J. Laue, and Leo V. Buck, both of Herrin, Ill., assignors to Fedders Corporation, Edison, N.J.

Filed June 1, 1971, Ser. No. 148,655
Int. Cl. F26b *11/02*
U.S. Cl. 34—139 **5 Claims**

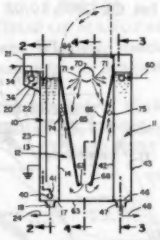


The axle of a horizontally mounted drum is provided with a special female receptacle. A delicate goods tray is provided with a male fitting adapted to fit within the female receptacle so as to cantilever support the tray and hold it stationary during movement of the drum. The tray is particularly adapted to hold goods which cannot be subjected to tumbling action during a drying operation.

3,724,096
APPARATUS FOR DRYING AN ELECTROPHOTOGRAPHIC SUPPORT

Arthur R. Mandeville, South Hadley, Mass., assignor to Scott Paper Company, Delaware County, Pa.

Filed May 6, 1971, Ser. No. 140,889
Int. Cl. F26b *13/00*
U.S. Cl. 34—150 **4 Claims**

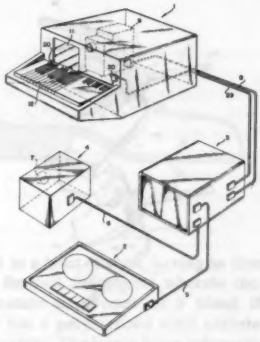


A method for drying an electrophotographic support element containing on its front surface a latent electrostatic image which has been developed in a liquid medium, in which the support element is placed on a downwardly inclined foraminous member so that its back surface contacts the foraminous member and its front surface is directed away from the foraminous member, and cool air is circulated over the front surface and the back surface of the support element so as to evaporate the volatile components of the liquid medium from the support element. Apparatus for drying, in accordance with the method described, an electrophotographic support element containing on its front surface a developed latent electrostatic image, including means to circulate cool air over the front and back surfaces of the support element held in an inclined position in a drying chamber. The method and apparatus are particularly useful for drying support elements which are of unusually large size and weight and which have toned images of a type rendering the support elements suitable for use as lithographic masters or offset printing plates on a printing press.

3,724,097
PROGRAMMED AUDIO-VISUAL PRESENTATION OF INFORMATION FOR INSTRUCTION IN THE OPERATION OF KEYBOARD CONTROLLED INSTRUMENTS

Arthur R. Schmoyer, 11708 River Road, Potomac, Md.

Filed June 10, 1971, Ser. No. 151,729
Int. Cl. G09b *15/04*
U.S. Cl. 35—6 **12 Claims**

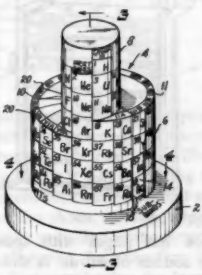


A system for instruction in the operation of a keyboard controlled instrument includes means for playback of synchronized prerecorded instructional programs including audio instructions and pictorial representations of the proper position of an operator's fingers when carrying out the audio instructions. In alternative embodiments, the pictorial representation is presented either proximate to the respective keys or is projected directly upon the key surface, but in either instance the position of the pictorially represented keys corresponds to that of the actual keys of the keyboard. The effect of the pictorial representation may be reinforced by additional indicators in the form of lights associated with the individual keys and projected thereon.

3,724,098
PERIODIC TABLE DISPLAY DEVICE

Dwight G. McSmith, 500 Chapel St., Hampton, Va.

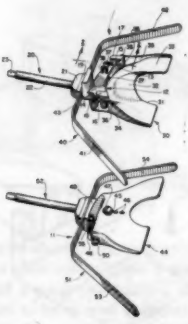
Filed April 8, 1971, Ser. No. 132,292
Int. Cl. G09b *23/24*
U.S. Cl. 35—18 R **5 Claims**



A three-dimensional device for displaying the periodic table of chemical elements in a substantially continuous helical sequence with substantially all elements arranged to be ad-

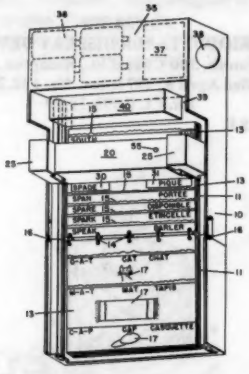
jacent those having sequential atomic number and with those of the same chemical family or group being arranged in the same column. A rotor in the device has indicia denoting the lanthanides and actinides and is rotatable to expose selected indicia through a window in the device.

3,724,099
REFERENCE PLATE WITH OUTRIGGERS FOR DENTAL WORK
Charles Edward Stuart, P.O. Box 891, Ventura, Calif.
Filed July 21, 1971, Ser. No. 164,695
Int. Cl. A61c 9/00
U.S. Cl. 32—19 **15 Claims**



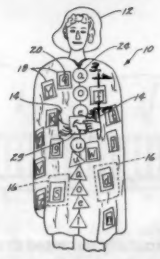
A dental reference plate has a bearing plate hinged to a frontal bar generally shaped to conform with the anterior portion of a patient's teeth. Clamped between the frontal bar and a removable stud is a pair of outriggers which may be used in conjunction with external holding means to assist in firmly holding the reference plate against the patient's jaw.

3,724,100
TALKING BOOK
Emile G. Surel, 6 Brigham Lane, Medway, Mass.
Filed Jan. 25, 1971, Ser. No. 109,247
Int. Cl. G09b 5/06
U.S. Cl. 35—35 C **8 Claims**



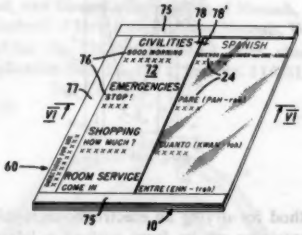
A talking book has pages with spaced-apart lines of recordings of the sounds of words. A slide is arranged to be movable by hand over the lines. Near one end of each line is the recorded word of that line written in one language, for example, English, and near the other end of that line is the recorded word of that line written in another language, for example, French. The slide has windows through which the written word can be seen. A motor driven pick-up head is supported by the slide, and is movable by the motor when the latter is started, over and along the length of a recorded line. The pick-up head contains a scanner for producing electrical currents of audio frequency corresponding to the recordings, which currents are amplified and converted into sound.

3,724,101
TEACHING GARMENT
Imogene F. Slezak, 520 North 5th, Carlisle, Iowa
Filed June 16, 1971, Ser. No. 153,700
Int. Cl. G09b 1/08
U.S. Cl. 35—35 R **9 Claims**



A cape for a teacher to wear having 21 colored patch pockets on the front with detachable patches thereon displaying the consonants of the alphabet. A vertical row of 10 patches down the center include long vowels in black on circles of white felt and short vowels on triangles of white felt. The patches having consonants and vowels may be removed from the garment and placed on a display board for spelling out words. The consonant patches are rectangular or square in shape. The pockets carry items or cards having first letters corresponding to the consonant on the patch.

3,724,102
LANGUAGE TEACHING DEVICE
Charles A. Van Patten, 1220 Park Avenue, New York, N.Y.
Continuation-in-part of Ser. No. 206,103, Dec. 8, 1972, abandoned. This application May 24, 1972, Ser. No. 256,529
Int. Cl. G09b 19/08
U.S. Cl. 35—35 H **20 Claims**



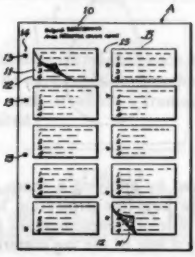
A language teaching device which includes an open-ended holder in which can be received a card having intelligence in a first foreign language provided on the opposite faces of the card. The intelligence is arranged on the card in a column of successive linear entries extending longitudinally of the card and corresponding intelligence in the language of the user is provided in like manner on portions of the sides of the holder, the holder being of a transparent material which is masked in respect of the portions thereof carrying intelligence so that the card may be viewed through the unmasked portions. The card and holder further are provided with cooperating indicia means for assuring that the corresponding side of the card ap-

pears through the unmasked portion of the holder and for aligning the intelligence on the card and that on the holder registrably thereby associating any given entry in the language of the card with its corresponding equivalent in the language of the holder.

3,724,103
METHOD FOR EDUCATIONAL TEST PREPARATION

Donald Walker, 2603 Greenfield Avenue, West Los Angeles, Calif.

Filed Dec. 17, 1971, Ser. No. 209,035
Int. Cl. G09b *1/06*
U.S. Cl. 35—48 A 8 Claims

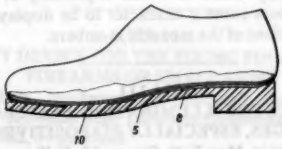


Adhesive-back question-bearing slips are taken from a teacher's file and affixed to a copy holder which consists of a back sheet to which the slips are adhesively attached, and a transparent cover or flap which folds downwardly from its upper margin over the back sheet, and which is imprinted with suitable heading data. The composite of back sheet, with attached question-bearing slips, and transparent fold-over part, constitutes a master copy which is inserted in a duplicator and reproduced in sufficient quantity to provide test sheets for all pupils of a class taking an examination, the heading data as well as the questions appearing on each test sheet. When duplication is completed, the copy holder is removed from the duplicator, the question slips are detached from the copy holder, and the slips are returned to the teacher's file for preservation for possible future use.

3,724,104
SHOE AND METHOD OF MANUFACTURING SAME

Otto Eder, Ternitz, and Wladimir Hascic, Maria Enzersdorf, both of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

Division of Ser. No. 839,728, July 7, 1969, Pat. No. 3,605,290.
This application Jan. 18, 1971, Ser. No. 107,000
Int. Cl. A43c *13/08*
U.S. Cl. 36—14 10 Claims

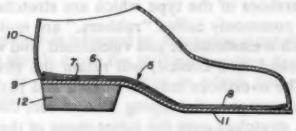


There is disclosed a shoe having an outsole of elastic material in which the connection between the outsole and the insole is interrupted at least in that area of the insole that underlies the ball portion of a wearer's foot. According to the invention, the interruption of the connection is accomplished by cutting out such area of such insole to leave an opening that is filled with elastic outsole forming material. There is further disclosed a method of making such a shoe in which an upper joined to an insole provided with an outsole connection interrupting means in the form of a cut-out is pulled over a last, a mold cavity is closed by the last and outsole forming material introduced into such cavity to mold an outsole and bond same to said formed upper and insole except at the area provided with said connection interrupting means.

3,724,105
FOOTWEAR

Donald Weight, Chalfont Saint Giles, England, assignor to Monsanto Chemicals Limited, London, England

Division of Ser. No. 793,559, Jan. 23, 1969, Pat. No. 3,624,191. This application March 18, 1971, Ser. No. 125,889
Int. Cl. A43b *13/38*
U.S. Cl. 36—44 8 Claims

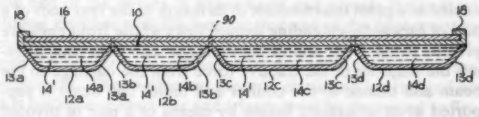


Footwear, such as a boot or shoe, having an insole comprising an extruded foamed resin sheet wherein the resin is an ethylene-vinyl acetate copolymer or a blend thereof with polyethylene and has a polymerized vinyl acetate content of 2–17 percent by weight. The insole has a substantially uniform thickness, a substantially closed cell structure, and a density of 17–40 pounds per cubic foot. Preferably, the insole is treated with an electric discharge prior to being bonded to the other components of the article of footwear. The insole can be bonded to these other components by any suitable means, preferably by the use of an adhesive.

3,724,106
INSOLE STRUCTURE

Herbert Magidson, 1450 Carla Ridge, Beverly Hills, Calif.

Filed June 29, 1971, Ser. No. 158,018
Int. Cl. A43b *13/38*
U.S. Cl. 36—44 4 Claims

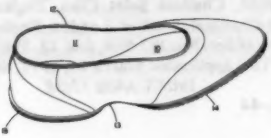


An insole structure for footwear comprised of upper and lower surfaces which form one or more internal cavities within the body of the structure, the cavities so formed containing a fluid such as water, air or a gel, providing thereby a durable and comfortable means for cushioning and supporting the feet inside footwear such as shoes, sandals, slippers and/or boots. The present invention may find embodiment in (i) a flexible contoured insole designed for insertion into conventional footwear or (ii) in footwear having the invented insole structure built into and made and integral part thereof. The shape, location, height, etc., of the cavities can be designed to achieve particular therapeutic objectives such as the support of weak arches.

3,724,107
ELASTIC OVERSHOES

Winnifred B. Makinen, Berea, and Raymond C. Srail, Parma, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Nov. 8, 1971, Ser. No. 196,663
Int. Cl. A43b 1/10
U.S. Cl. 36—7.3 6 Claims

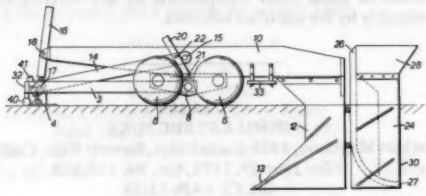


Elastic overshoes of the type which are stretched over the street shoes, commonly called "rubbers," are molded from a material which is elastomeric and vulcanized, and which when heated, stretched, and cooled, will retain the stretched size and shape. The overshoes may be heated and pressed into a solid cake for storage and shipping. Before use, the overshoes are reheated, stretched over the street shoes of the user while hot, and when cooled, will retain the proper size and shape to fit the user's shoes.

3,724,108
PLOW DEPTH ADJUSTMENT APPARATUS

Eric Arthur Clayton, Stockton-on-Tees, England, assignor to Hadswell Yates Developments Limited, Yorkshire, England

Filed Jan. 29, 1971, Ser. No. 110,821
Int. Cl. E02f 5/18
U.S. Cl. 37—193 13 Claims



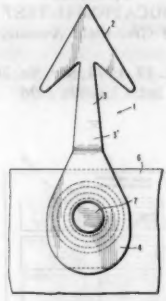
A mole plough comprises a wheeled carriage on which is pivotally mounted an elongated rigid beam carrying at its rear end a coulter provided with a mole. The beam is pivotally connected at a point intermediate in its length to the rear ends of a pair of forwardly-extending tension links whose front ends are pivoted to the front end of the carriage. The links thus transmit the majority of the tractive force from the carriage to the beam and thence to the coulter and mole. The beam is supported at an adjustable height by means of a pair of pivoted raising rams acting between the carriage and the links near their rear ends. At its front end the beam is provided with a grading control ram acting between the front end of the beam and the front end of the carriage, extension and contraction of the grading control ram altering the height of the front end of the beam relatively to the carriage.

3,724,109
PLASTIC TAG-FASTENING ELEMENT

Erwin A. Ruegg, Stony Point, N.Y., assignor to Staffel Seals Corporation, Tuckahoe, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,165
Int. Cl. G09f 3/12
U.S. Cl. 40—22 16 Claims

A plastic body to be attached to a flat tag, for example, for securing such tag to a wide mesh woven sack, which includes at one end an anchoring portion and at the other end a tag-fastening portion consisting of two substantially flat, parallel leg portions defining therebetween a tag-receiving slot; one of the leg portions is provided with a boss-like projection formed integrally with the same in the "as-molded" condition such that the weak connection, which exists between these two

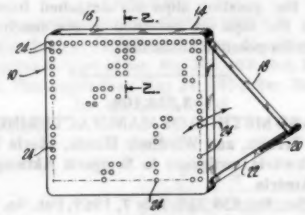


parts, can be severed by applying a sharp axial blow to the outer surface of the boss-like projection to drive the same through an aligned hole of complementary shape in the other leg portion whereby a slug of the tag material is punched out and the plastic body is securely fastened to the tag after the end of the projection in the hole is enlarged in a rivet-like manner.

3,724,110
VISUAL DISPLAY BOARD

Norman L. Meyerson, Glen Rock, N.J., assignor to Worthington Corporation, Harrison, N.J.

Substitute for Ser. No. 867,271, Oct. 17, 1969, abandoned.
This application May 22, 1972, Ser. No. 255,787
Int. Cl. G09f 11/00
U.S. Cl. 40—28 C 2 Claims



A visual display device with a multi-apertured front side. The apertures are the forward ends of a plurality of passages in the visual display board in which a plurality of respective movable members cause a character to be displayed responsive to the positions of the movable members.

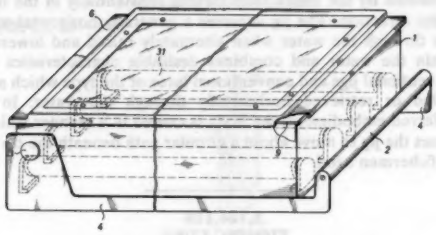
3,724,111
APPARATUS FOR ILLUMINATING TRANSPARENT IMAGES, ESPECIALLY DIAPOSITIVES

Karl Heinz Grieger, Max-Eyth-Strasse 12, Nellingen, Germany

Filed Jan. 14, 1971, Ser. No. 106,389
Claims priority, application Germany, Jan. 15, 1970, P 20 01 632.4; Oct. 8, 1970, G 70 37 173.2
Int. Cl. G09f 13/10
U.S. Cl. 40—106.1 5 Claims

An apparatus for illuminating diapositives, negatives or the like for inspecting the same which comprises a box-shaped housing the open upper side of which is covered by a plate of opal glass or the like and carries a supporting frame the lateral sides of which are provided with index studs upon which a flat,

partly transparent, pocketlike element for holding one or more diapositives or the like may be applied in different positions. This frame is adapted to receive a cover frame for holding down the pocketlike element in each of its positions. This cover frame may be exchanged for another which is provided with apertures in each of which a framed diapositive or the like may be deposited.

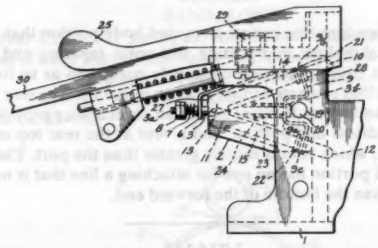


3,724,112

FIRING PIN MECHANISM FOR FIREARMS

Douglas E. Bulls, and John P. Linde, both of Ilion, N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed July 7, 1971, Ser. No. 160,434
Int. Cl. F41c *19/00, 19/18*
U.S. Cl. 42—41 **3 Claims**



A unique "floating-type" forwardly biased firing pin arrangement for firearms. The system is designed to prevent breakage of the pins resulting from "dry-firing" the gun. The firing pins are striker or hammer initiated. When the gun is loaded, the hammer engageable ends of the pins protrude from a housing within the receiver so that they are capable of being struck. When the firearm is not loaded, the hammer engageable ends of the pins are recessed behind the housing face, where they remain inaccessible to the hammers, causing the housing to absorb the full impact of the hammer blows.

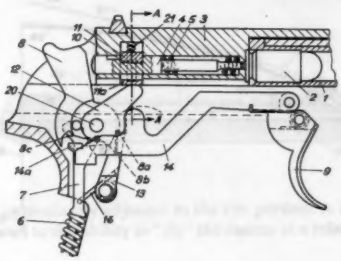
3,724,113

SAFETY DEVICE FOR THE FIRING PIN OF HAND FIREARMS OR SMALL ARMS

Walter Ludwig, Neuhausen am Rheinfall, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Aug. 19, 1971, Ser. No. 173,004
Claims priority, application Switzerland, Aug. 24, 1970, 12618/70
Int. Cl. F41c *17/04*
U.S. Cl. 42—70 F **3 Claims**

A safety device for the striking bolt of a hand firearm comprises a spring-loaded safety bolt which in the safety position engages a recess in the axially slidable striking bolt and has an extension engaged by a safety lever operable by a trigger controlled by a pivotally mounted striking hammer. The safety lever has thereon a projection for the purpose of slidably moving the safety bolt and simultaneously therewith rotating a catch lever into a position in which the striking hammer is released. A special release lever which engages a projection on a release disk is adapted to disengage a catch lever and is effective to slowly move the striking hammer during its return stroke into its released position in which the catch lever is locked in safety position.



3,724,114

NON-LETHAL HOME DEFENSE IMPLEMENT

Kenneth W. Jones, 205 Railroad, Claredon Hills, and Edward H. Richie, 4327 Elm St., Downers Grove, both of Ill.

Filed Dec. 31, 1970, Ser. No. 103,022
Int. Cl. F41c *19/12, 21/14, 27/00*
U.S. Cl. 42—84 **8 Claims**

A non-lethal home defense implement in the form of a projectile firing tube for firing a non-lethal type projectile, in which the tube nozzle end has a hand grip portion equipped with a hand operated contact closing member for energizing a target light beam directed in the direction of firing, and the other end of the implement is equipped with a hand grip portion including a trigger for firing the tube. The operator holds one end of the device in either hand and presses the contact closing member with the hand at that end of the implement to energize the contact beam for directing same at the target, with the trigger being actuated by the other hand to fire the implement. The implement electric circuiting is arranged so that both the contact bar and trigger must be depressed to fire the implement.

3,724,115

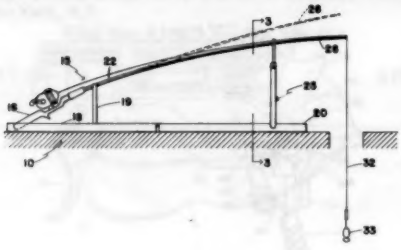
FISHING DEVICE

Clifford Derie, 16 Sackville Drive, S. W., Calgary, Alberta, Canada

Filed Nov. 8, 1971, Ser. No. 196,524
Int. Cl. A01k *97/00, 97/10*
U.S. Cl. 43—15 **12 Claims**

A support for a fishing rod comprising a base with means thereon to support the rod at an inclined angle. The rod butt is held adjacent one end of the base and a member extending upwardly from the base supports the rod at an intermediate point thereof. Another member having a hooked end to detachably hold the rod adjacent the tip end under tension is pivotally secured adjacent to the other end of the base. When the rod

tip is pulled downwardly the hooked end is released and the rod snaps upwardly to set the hook in the fish's mouth. The

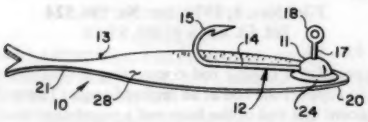


base is foldable and includes means to store the component parts therein.

3,724,116
FISH HOOK FOR USE WITH A PLASTIC WORM
Ronald J. Lindner; Allen J. Lindner, both of Route 6, and Nicholas S. Adams, Route 7, all of Brainerd, Minn.
Filed March 4, 1971, Ser. No. 120,946
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.24 **6 Claims**

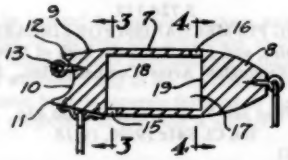
A weedless plastic worm rig characterized by a leader, a conical slip sinker slidable on the leader, a plastic worm and a long shank sproat hook. The trailing end of the shank terminates in a relatively short pointed barb. The leading end is doubled upon itself to form a line attaching eye and embodies a J-shaped terminal end portion which is wholly embedded and anchored in the head of the worm to prevent the worm from sliding down the shank. The short pointed barb is embedded in the worm to assume an upward bite-responsive locale immediately under the surface of the skin of the worm.

3,724,117
FISHING JIG HAVING A FLEXIBLE BODY
Lindley E. Flanagan, Jr., 5700 Rockville Road, Forth Worth, Tex.
Filed Sept. 3, 1971, Ser. No. 185,122
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.24 **8 Claims**



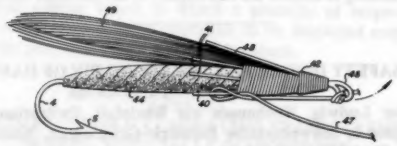
A fishing jig having a hook, weight means for causing the lure to sink within the water, means for maintaining the lure in a substantially upright position within the water, and an elongated body of flexible, resilient, sheet material. The body extends from the weight means alongside the hook shank and is free to flex in a direction away from the hook shank but is prevented by the shank from flexing substantially in the opposite direction. The jig achieves a generally horizontal motion through the water when alternately raised and lowered within the water and combines desirable characteristics of conventional jigs and conventional lures of the type which are trolled or retrieved horizontally through the water. In a preferred embodiment, the body is canted in a manner which causes the jig to move about a circular path beneath the tip of the fisherman's rod.

3,724,118
FISHING LURE
George F. Putthoff, 7146 Lydia, Kansas City, Mo.
Filed May 26, 1971, Ser. No. 146,905
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.06 **5 Claims**



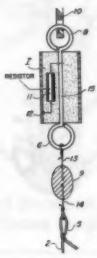
A fishing lure that has an elongated body portion that has a cylindrical hollow mid-portion and solid tapering end portions, the front end being concavely curved so as to form a lower lip that projects further than an upper lip. The lure has a port at the bottom forward end of an air chamber provided in the cylindrical mid-portion, and a vent at the rear top of this chamber, which vent is slightly greater than the port. The forward end portion has an eye for attaching a line that is nearer the top than the bottom of the forward end.

3,724,119
FISHING FLY WITH LEADER ATTACHING PRONGS
Allen Lewis Putnam, Fullerton, Calif., assignor to Allen Putnam; Leland C. Launer and Mark L. Kerridge, all of Fullerton, Calif., part interest to each
Division of Ser. No. 704,457, Feb. 12, 1968, Pat. No. 3,500,574. This application March 16, 1970, Ser. No. 24,444
Int. Cl. A01k *85/08*
U.S. Cl. 43—42.25 **1 Claim**



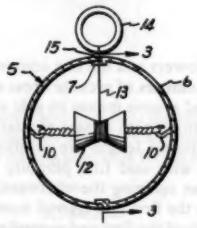
A fishing fly comprising a hook having a shank, an eye and a barbed point, a fly body and head formed on the shank between the eye and the barbed point and an attaching means for a leader mounted between the head and the body. The attaching means is lashed to the fly body and to the hook shank to form top and bottom prongs and right and left side prongs extending from their positions behind said head to points substantially half-way down the length of the fly's body.

3,724,120
DELAYED RELEASE DEVICE
Joseph D. Richard, 3613 Loguat Avenue, Miami, Fla.
Filed Dec. 18, 1970, Ser. No. 99,606
Int. Cl. A01k 93/00
U.S. Cl. 43—100 1 Claim



An improved delayed release device comprising an expendable anode linkage and a re-usable cathode assembly for temporarily securing fishing gear beneath the sea surface. The highly corrosive anode member of the galvanic couple breaks after a predetermined period of immersion in seawater. Changes in corrosion rate due to variations in sea water conductivity are substantially reduced by including an electrical resistance between anode and cathode members of the couple.

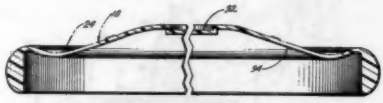
3,724,121
BANDALORE
Luther C. Atkins; Jimmy G. Atkins, and Vonniebelle Atkins, all of 5207 North Villa, Space No. 7, Clovis, Calif.
Filed Nov. 22, 1971, Ser. No. 200,862
Int. Cl. A63h 27/12
U.S. Cl. 46—61 4 Claims



This invention consists of a ball made in two parts in which is secured a spindle held in place by a rubber band at each end thereof. The outer end of each rubber band is secured by a hook to the inside wall of the aforesaid ball. A string is wrapped around the longitudinal center of the aforesaid spindle and extends upward through an opening in the aforesaid ball. When the spindle in the ball rotates and winds up, the rubber bands will cause the invention to ride up and down on the string which is held in the hand.

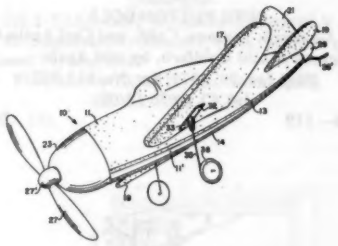
3,724,122
FLYING SAUCER
Richard L. Gillespie, Sr., San Gabriel, Calif., assignor to Wham-O Mfg. Co., San Gabriel, Calif.
Filed March 16, 1971, Ser. No. 124,784
Int. Cl. A63b 27/00
U.S. Cl. 46—74 D 11 Claims

An improved saucer shaped throwing implement. A portion of the upper surface of the saucer located intermediate a circular rim portion and crown portion is also below the points of maximum elevation of the rim and crown portions to create a trough or depression extending around the saucer which is



located immediately adjacent to the rim portion. A low profile contributes to the ability to "fly" the saucer at a relatively high speed.

3,724,123
FLYING MODEL AIRPLANE
Jerome H. Lemelson, 85 Rector Street, Metuchen, N.J.
Filed July 6, 1971, Ser. No. 160,006
Int. Cl. A63h 27/02
U.S. Cl. 46—78 11 Claims



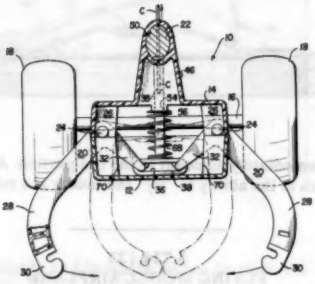
A propellor driven model airplane having a body which is molded of light weight, expanded, cellular plastic material which is capable of self-supporting although incapable of properly supporting a motor per se for driving the propeller of the model airplane. A special, thin walled nose fitting is secured to the nose end of the cellular plastic body and rotatably supports a propeller mounted on the shaft to which is attached one end of a rubber band motor. The other end of the motor is retained by a hook forming part of a special fitting at the tail end of the cellular plastic body.

In a particular embodiment, the cellular plastic body is shaped with a channel extending longitudinally therealong which is open substantially the length of the body and provides ample space for accommodating the rubber band motor. In another form, other suitable fittings are also provided for properly securing landing gear to the wings or body of the model airplane.

3,724,124
ROBOT PUSH TOY
Charles F. Foley, Minnetonka; Charles D. McCarthy, Wayzata, both of Minn., and Charles H. Hardin, Nashville, Tenn., assignors to Kusan, Inc., Nashville, Tenn.
Filed Feb. 22, 1972, Ser. No. 227,872
Int. Cl. A63h 11/10
U.S. Cl. 46—97 10 Claims

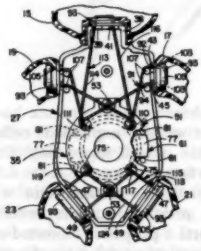
A wheeled, figure push toy of the robot type having arms or upper legs which are pivotable together from a spread out

position by means of an operating lever adjacent the handle of a push rod by which means the figure may be propelled and/or



tilted toward the supporting surface to pick up or put down an object such as a child's block, etc.

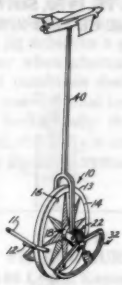
3,724,125
PUSH BUTTON DOLL
Adolph E. Goldfarb, Tarzana, Calif., and Carl Ayala, Chicago, Ill., assignors to said Goldfarb, by said Ayala
Filed Jan. 29, 1971, Ser. No. 111,037
Int. Cl. A63h *11/00*
U.S. Cl. 46—119 14 Claims



A doll comprised of a body to which is affixed controllably movable separate limbs and a head. In the body there is disposed a spring loaded button which is accessible from the front of the doll. Means individually connect each of the limbs and head to the button so that with the button in a normal position the limbs and head are in certain positions. Upon depression of a portion of the button, there is attendant movement of the limb or limbs, or the head connected to the portion of the button depressed.

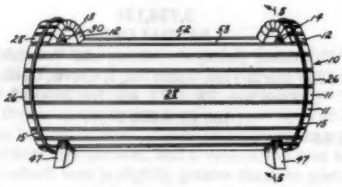
3,724,126
TOY HOOP WITH STABLE PLATFORM FOR DECORATIVE DISPLAYS
Alfred Cyrus LaGrow, 3615 North Harvard, Peoria, Ill.
Filed May 4, 1971, Ser. No. 140,041
Int. Cl. A63h *13/02*
U.S. Cl. 46—220 12 Claims

An ornamental hoop, or similar rotating member, with a counterbalance supported from the center axis of the member, serving to stabilize the hoop during rotation and



maintain an ornamental standard in a vertical position during operation.

3,724,127
HORIZONTALLY ORIENTED PLANTER
Wallace Rosenwach, 2 Harbow Road, Great Neck, N.Y.
Filed Nov. 11, 1971, Ser. No. 197,658
Int. Cl. A01g *9/02*
U.S. Cl. 47—34 1 Claim

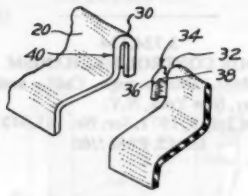


A planter for flowers and the like comprising a first plurality of longitudinal members of arcuate cross section, each having mating tongue and groove means on side surfaces thereof, and extending the entire length of said planter. A second plurality of members of shorter length are positioned in arcuate juxtaposed relation with said first plurality at each end of the latter to define an opening therebetween. A tensioned strap means surrounds the first and second members at each end of the opening. Each of the first and second members is provided with a groove on an inwardly disposed surface to engage one of first and second end wall members which are provided with a corresponding tongued peripheral area engageable therewith. The device relies upon the constrictive forces of the strap members to maintain it in assembled condition, in the absence of any gluing.

3,724,128
PLANTER
Michael T. Tabone, 248881 Ward, Taylor, Mich.
Filed Jan. 15, 1971, Ser. No. 106,833
Int. Cl. A01g *1/08*
U.S. Cl. 47—33 13 Claims

This invention relates to a planter. It comprises plastic toroidal members having corresponding interlocking male and female portions. These members have an inner upward vertical portion; an intermediate horizontal portion; and an outer downward vertical portion. The inner upward vertical portion is raised above the ground and surrounds the soil which is immediately adjacent the plant. The intermediate horizontal portion is substantially level with the ground level outward from

but adjacent the planter. The outward downward vertical portion depends from the intermediate horizontal portion and extends vertically downward therefrom segregating the soil portion, outward from but adjacent the planter, from the plant.

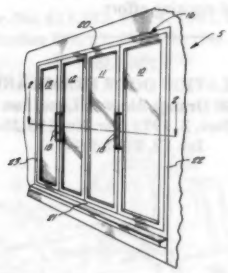


3,724,129

DOOR AND DOOR MOUNTING FRAME

Michael E. Stromquist, Studio City, Calif., assignor to Anthony's Manufacturing Company, Inc.

Filed Dec. 14, 1970, Ser. No. 97,672
Int. Cl. E06b 7/00
U.S. Cl. 49—70 9 Claims



A refrigerated cabinet door and door mounting frame structure for mounting a plurality of electrically heated refrigerator doors with each door having selectible left or right hinging.

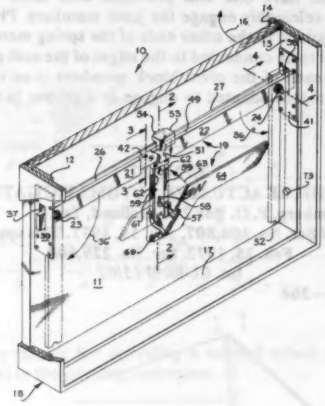
3,724,130

CLOSURE ASSEMBLY AND EMERGENCY RELEASE LOCKING MECHANISM THEREFOR

Joseph A. Bogue, 661 Eden Avenue, San Jose, Calif.

Filed Aug. 5, 1971, Ser. No. 160,352
Int. Cl. E05c 15/02
U.S. Cl. 49—141 7 Claims

A lock mechanism for use on an exit door adapted to be mounted in a door frame having spaced parallel jambs comprises a pair of tandemly abutting bars extending across the inside face of the door. The remote ends of the pair of bars engage a portion of a respective one of the jambs to preclude opening the door from the outside. Means are provided supporting each of the bars comprising a pivot axis normal to the door and disposed closer to the laterally outer end of the bar than to the other end thereof so as to permit its remote end to rotate out of engagement with its associated one of the jamb portions. Yieldable retaining means readily releasably engages and holds the bar from rotating about its pivot axis while means for releasing the bars conjointly to rotate downwardly about their respective pivot axes are provided to include a depresser element movable between advanced and retracted positions to engage the abutting ends of the bars to move the bars free of the retaining means thereby permitting the bars to rotate about their respective pivot axes under their own weight and disengage the remote ends of the bars from the jamb portions.

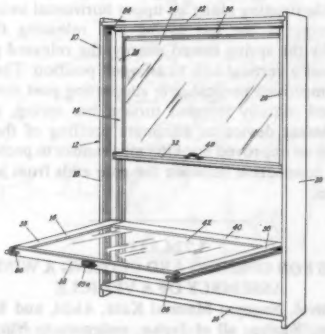


3,724,131

TILT-TAKE-OUT WINDOW ASSEMBLY

Theodore H. Schnormeier, Gambier, Ohio, assignor to Wenco, Inc., Mount Vernon, Ohio

Filed March 13, 1972, Ser. No. 234,146
Int. Cl. E05d 15/22
U.S. Cl. 49—181 7 Claims



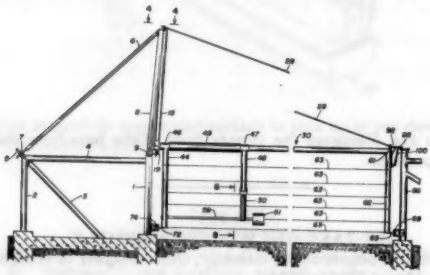
The specification and drawings disclose a tilt-take-out window assembly which includes a frame having a pair of spaced apart, generally parallel jamb members which between them define a recess. Guide members in the form of flexible, elongated strips are joined to each of the jamb members to define parallel guide tracks intermediate outwardly extending, raised portions. The flexible strips are joined to the jamb members along at least one of their edges and have a normal configuration to bow into the recess. Window sash members (having lateral edges spaced apart a width very slightly less than the distance between the jamb members but greater than the distance between the strips in their bowed configuration) are positioned between the guide tracks. For example, the window sash members may have lateral edges spaced apart a width about 3/16 inch less than the distance between the jamb members as compared with the usual width of prior art constructions of about 1 3/16 inches less than the distance between the jamb members. The lateral edges of the sash members have guide grooves formed therein to receive the outwardly extend-

ing portions of the flexible strips. Additionally, counterbalance spring members are carried in each of the guide grooves and have one end provided with hook members adapted to releasably engage the jamb members. Pivot block means are joined to the other ends of the spring members and are adapted to be connected to the edges of the sash members. Carried in each of the pivot block members is an outwardly biased pin means adapted to engage in a groove in the guide track.

3,724,132
VEHICLE ACTUATED AUTOMATIC GATE

Felix B. Romberg, P. O. Box 218, Holland, Tex.

Division of Ser. No. 106,807, Jan. 15, 1971. This application Feb. 25, 1972, Ser. No. 229,600
Int. Cl. E05f *13/02*
U.S. Cl. 49—364 **3 Claims**

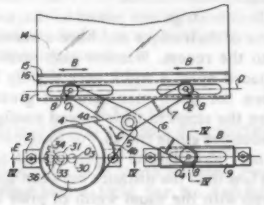


The specification discloses a rectangular gate normally latched at one end and including an initially stressed torsion bar spring horizontally disposed at the other end. When thrust from a vehicle is applied to the gate, the gate yields along the bottom while rotating along an upper horizontal axis, thereby storing energy in the bar spring and releasing the latch. Propelled by the spring stored energy, the released gate then springs about a vertical axis to an open position. The gate includes an improved vertical gate supporting post mechanism, an improved initially stressed torsion bar spring, a vehicle bumper contact device to eliminate scuffing of the vehicle bumper and an improved hooking mechanism to protect a unitary frame connection between the gate ends from additional wire tension.

3,724,133
MEANS FOR OPENING AND CLOSING A WINDOW ASSEMBLY OF A VEHICLE

Takeaki Shirai, Nagoya; Masumi Kato, Aichi, and Kiyomitsu Oshikawa, Kariya, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed March 25, 1971, Ser. No. 127,956
Claims priority, application Japan, April 3, 1970, 45/28717; April 4, 1970, 45/28925
Int. Cl. E05f *11/44, 15/16*
U.S. Cl. 49—349 **5 Claims**

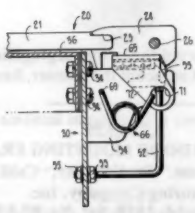


Means for automatically opening and closing a window assembly of a vehicle comprising an X-shaped linkage assembly, a power unit and three rollers rotatably secured to the linkage assembly, the rotation of power unit being transmitted to an internal gear provided at an arm forming the linkage, thereby moving up or down the arm and opening and closing the window assembly.

3,724,134
DOOR CONTROL MECHANISM

Michael A. Verdone, Hillsborough, Calif., assignor to The Singer Company, New York, N.Y.

Filed July 9, 1971, Ser. No. 161,042
Int. Cl. E05f *1/00*
U.S. Cl. 49—379 **9 Claims**

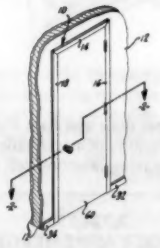


A mechanism for controlling the partial opening of a cover, or door, of a cabinet upon release of a latch and for thereafter retaining the door in a fully open position following the exertion of an additional opening effort.

3,724,135
QUICK INSTALLATION DOOR FRAME AND METHOD

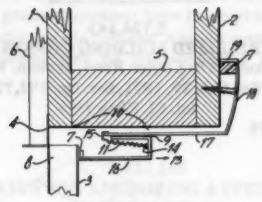
John S. Heliotes, 350 Orange Blossom Lane, San Rafael, Calif.

Filed Nov. 3, 1971, Ser. No. 195,264
Int. Cl. E06b *1/04*
U.S. Cl. 49—504 **14 Claims**



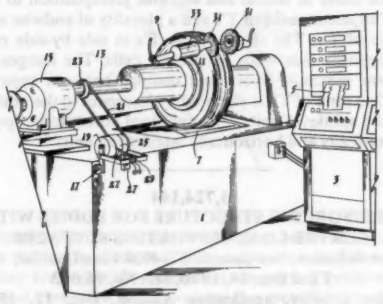
A quick-installation metal door frame for mounting a door between upright cripples. Hinge and strike frame sides are joined at their upper ends to a horizontal header by means of an overlapping, nesting miter joint. The hinge and strike plates are mounted in depressions formed in frame sides, and fastener means extend into the associated cripples through recessed holes formed in the depressions so that the hinges or strike plate trap the fastener means concealing them from view. The frame sides are thus secured to the cripples so as to provide an assembled door frame which is properly aligned, even though the cripples may be out of plumb. Bendable tabs are formed at the lower ends of the hinge and strike frame sides in a manner affording simplified attachment to a wall structure, with the tabs concealed from view by the abutting wall base member or rug. Tab slots provide a range of vertical adjustment for the frame sides without the necessity of removing the tab fasteners. A protective layer is secured to the outer surface of the header, hinge and strike frame sides, and this layer is adapted for removal after assembly of the door frame to expose the underlying frame surfaces.

3,724,136
SELF ADJUSTING WINDOW TRIM
Albert G. Forsberg, R.R., Theodosia, Mo.
Filed Sept. 30, 1970, Ser. No. 77,176
Int. Cl. E06b *1/04*
U.S. Cl. 49—505 2 Claims



Inside and outside trim for metal and plastic windows which can be adjusted to fit with self adjusting means to keep proper fit thereafter.

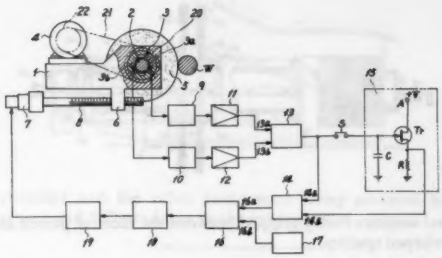
3,724,137
MEANS FOR CORRECTING NON-UNIFORMITY IN TIRES
Clarence Hofelt, Jr., Cuyahoga Falls, and John E. Corl, Akron, both of Ohio, assignors to The General Tire & Rubber Company
Division of Ser. No. 613,252, Feb. 1, 1967, abandoned. This application Feb. 27, 1970, Ser. No. 18,773
Int. Cl. B24b *5/00*
U.S. Cl. 51—106 R 21 Claims



Self-excited force variations in rolling pneumatic vehicle tires are a principal source of vehicle shake, roughness, and steering disturbances. These variations in a tire are measured by a tire uniformity machine after which the tire is subjected to a corrective action consisting of the removal of a small amount of tread material at the proper location.

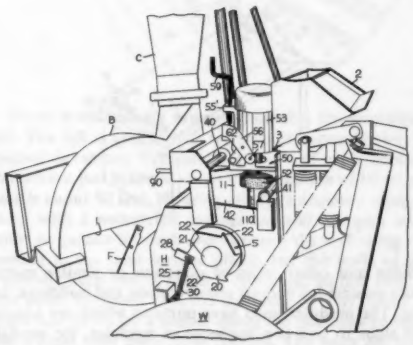
3,724,138
GRINDING RESISTANCE DETECTING DEVICE
Mineo Ishikawa, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan
Filed Sept. 29, 1971, Ser. No. 184,672
Claims priority, application Japan, Oct. 2, 1970, 45/86979
Int. Cl. B24b *49/16*
U.S. Cl. 51—165 R 5 Claims

A grinding resistance detecting device includes a strain sensitive transducer having semiconductor strain gauges for generating an output voltage level proportional to a grinding resistance. A contact is connected to the strain sensitive transducer and is closed at a non-grinding period. A memory circuit is connected to the contact for storing a drift voltage level of the strain sensitive transducer and a differential-input amplifier is connected to the strain sensitive transducer and to



the memory circuit for providing a voltage which is purely proportional to the grinding resistance.

3,724,139
BLADE SHARPENING DEVICE FOR ROTATABLE CHOPPING CYLINDERS
John H. Leverenz, West Bend, Wis., assignor to Gehl Company, West Bend, Wis.
Filed June 11, 1971, Ser. No. 152,206
Int. Cl. B24b *19/00, 3/00, 5/18*
U.S. Cl. 51—249 7 Claims

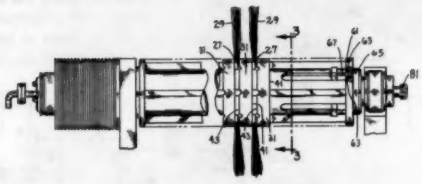


A blade sharpening device for use on a rotatable chopping cylinder of a forage harvester or the like, which cylinder has a plurality of circumferentially spaced and generally parallel blades that are of a generally spiral shape. The device includes a carriage that moves along parallel to the cylinder and has a sharpening tool extending from it for contact with the blades, and guide means connected directly to the carriage for guiding abutment with a succeeding blade whereby as the carriage moves along the axis of the cylinder, the guide means abutting against the succeeding blades insures that the sharpening tool is at all times properly orientated to the blade being sharpened.

3,724,140
BUFFING WHEEL
John Ford Harper, Ames Hollow Road, Portland, Conn.
Filed Nov. 12, 1971, Ser. No. 198,254
Int. Cl. B24b *9/02*
U.S. Cl. 51—332 5 Claims

The buffing wheels of this invention include a buffing wheel shaft on which buffing wheel sections and spacers are al-

ternately slidably mounted with the spacers interconnected in keyed engagement with each other and with the rims of the

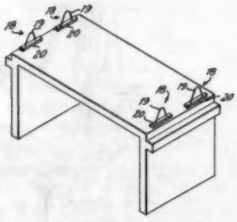


wheel sections firmly gripped between the faces of paired and interkeyed spacers.

ERRATUM

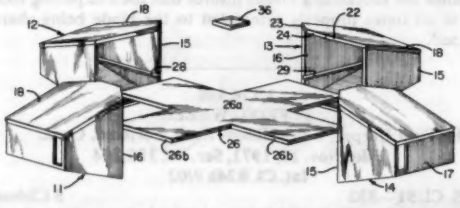
For Class 52—177 see:
Patent No. 3,724,078

3,724,141
MODULAR UNITS, BUILDINGS AND SYSTEMS
Michael J. Kelleher, Greenway Apartments, Route 73, West Berlin, N.J.
Filed Jan. 15, 1970, Ser. No. 3,113
Int. Cl. E04h *1/04*
U.S. Cl. 52—79 **11 Claims**



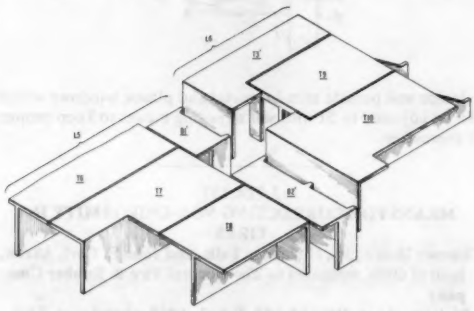
Modular and other units of concrete or similar matter, generally precast for various constructions and buildings, and housing. The modular units have portions which are adapted to hold slabs to link two consecutive modules, the modules can be stacked vertically, and the system comprising such modules and slabs can be extended laterally and longitudinally to form a great variety of buildings.

3,724,142
MODULAR BUILDING STRUCTURE
Carl A. Worthington, 2026 Balsam Drive, Boulder, Colo.
Filed Jan. 6, 1971, Ser. No. 104,211
Int. Cl. E04b *1/348*
U.S. Cl. 52—73 **8 Claims**



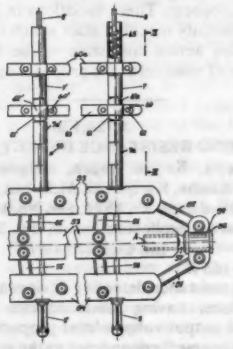
In a modular building structure there is provided a plurality of prefabricated modular units arranged to branch outwardly from a common central area and connected together to form a central room. Each modular unit has an open inner end and terminates in an outer end wall. A horizontally disposed floor member partitions each modular unit into an upper room and a lower space. The modular units are conveniently arranged side by side or one on another to provide building structures of a desired size.

3,724,143
INDUSTRIALIZED BUILDING CONSTRUCTION
Visvaldis Paukulis, 176 Collins Road, Waban, Mass.
Filed Oct. 29, 1971, Ser. No. 193,773
Int. Cl. E04h *1/04*
U.S. Cl. 52—79 **17 Claims**



The building construction employs precast elongated T'shaped elements (T's) or T's and modified T's, i.e., half T's or inverted L-shaped elements. The T's are superposed one over the other in lateral and endwise juxtaposition to form a pair of adjacent ranks of T's and a plurality of endwise extending files of T's. The stems of the T's in side-by-side relation form opposite side walls of internal cells. The flanges of the T's form common floors and ceilings between superposed cells. One rank of T's is elevated with respect to the other rank to define splitlevel units. The splitlevel construction provides both vertically and horizontally interleaved units.

3,724,144
REINFORCING STRUCTURE FOR BODIES WITH CURVED LOAD-SUPPORTING SURFACES
Wilhelm Schuster, Neubauzeile 57, 4020 Linz/Danube, Austria
Filed Dec. 14, 1970, Ser. No. 98,003
Claims priority, application Austria, Dec. 12, 1969, A 11611/69
Int. Cl. A47b *83/04*; E04h *12/18*
U.S. Cl. 52—108 **11 Claims**



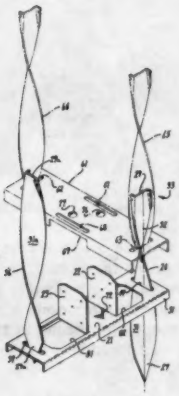
A tensionable internal reinforcing structure for a mattress, seat cushion or the like, comprising one or more elongate ten-

sion members each traversing a column of mutually abutting pressure elements to form a collapsible armature, includes several wedge pieces which are inserted between adjoining pressure elements to impart a desired curvature to the armature. The wedge pieces may be in the form of longitudinally slitted sleeves which are clipped either directly onto a tension member or onto a pressure element, being provided in the latter case with triangularly profiled end flanges to separate the engaged pressure element from its neighbors on one side of the centerline of the column. Aligned wedge pieces of adjoining armatures may be interconnected by a transverse strap.

3,724,145
APPARATUS FOR ANCHORING A STRUCTURE TO EARTH MATTER

Dorce L. Daniel, 1115 W. 5th Street, Benicia, Calif.

Filed April 5, 1971, Ser. No. 131,182
Int. Cl. E02d *5/80*
U.S. Cl. 52—157 **5 Claims**



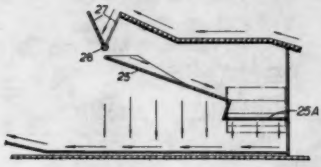
Apparatus for anchoring a structure, such as a fence, to earth matter is disclosed. The apparatus includes a base member formed with a structure supporting portion and at least one elongated stake, preferably a metallic strip, having a twist or helical surface which engages the earth matter. The stake is preferably formed with means to lock it against the rotation relative to the base and against axial displacement of the base away from the earth matter and stake. The use of two helical strip-like stakes driven into slots in the base and the use of a second super-imposed base member are disclosed.

3,724,146
VIBRO-GYRATORY MILLS

Denis Fahey, and Reginald L. Clarke, both of Newcastle-under-Lyme, England, assignors to William Boulton Limited, Burslem, Stoke-on-Trent, Great Britain

Filed Jan. 4, 1971, Ser. No. 103,560
Claims priority, application Great Britain, Nov. 4, 1969, 53,929/69
Int. Cl. B24b *31/00, 1/00;* **B02c** *17/14*
U.S. Cl. 51—163 **7 Claims**

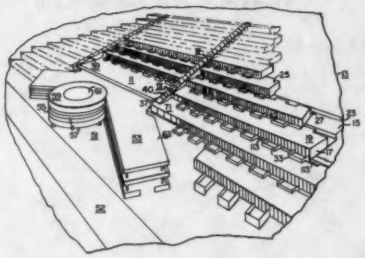
A vibro-gyratory grinding or finishing mill with an annular treatment chamber round which the charge of workpieces and media progresses under the influence of the vibratory movement, separation of workpieces and media being effected by exposing a normally covered screen to the charge, one component the charge falling through the screen and back into the chamber and the other component being retained by the screen and delivered to a discharge opening.



3,724,147
HOUSING ASSEMBLY ON A HILLSIDE

Nathan S. Levenson, 1365 Cordova Road, Pittsburgh, Pa.

Filed Jan. 8, 1971, Ser. No. 104,982
Int. Cl. E04h *1/02*
U.S. Cl. 52—169 **11 Claims**



There is disclosed a housing assembly for disposition on a hill. The hill is graded into terraces at approximately equally spaced elevations. Typically the height of each terrace above the terrace just below is about 9 feet and the width of each terrace is about 50 feet. Housing units are disposed along the terraces with a pedestrian passageway and an open area for a court or garden for each unit between the wall rising from the terrace to the next terrace above and the walls of the unit. Typically each unit is about 9 feet high, 40 feet long, and 32 feet wide, for lower cost the unit may be 9 by 36 by 24 feet. Each unit provides a shelter along the passageway below and has a clear view away from the hill. The units are formed of two-bedroom modules which are readily convertible into one- and three-bedroom units. The passageways for the units are approachable by a pedestrian approach perpendicular to the terraces at an angle to the horizontal convenient for pedestrian use. Parking, recreational, and service facilities are on the periphery of the assembly.

ERRATUM

For Class 52—192 see:
Patent No. 3,724,881

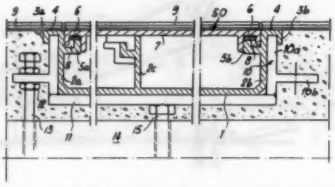
3,724,148
CABLE RECEIVING FLOOR CONDUIT

Otto Bregenzer, St. Gallen, Switzerland, assignor to O. Bregenzer & Co., St. Gallen, Switzerland

Filed Aug. 28, 1970, Ser. No. 67,780
Claims priority, application Switzerland, Sept. 3, 1969, G 13448/69
Int. Cl. E05f *17/08*
U.S. Cl. 52—221 **9 Claims**

A floor conduit for laying cables and pipes and similar structures comprises at least one substantially U-shaped section

which is closed by a cover. The U-shaped section includes upright longitudinal walls and the outer ones have downwardly opening hooks at each top side which provide a

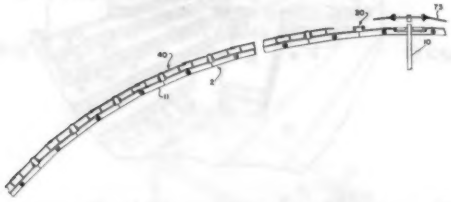


level top support for the floor structure and which also supply an engagement surface for engaging over a supporting beam supporting the conduit.

3,724,149
VENTILATED, SHADED, WATERPROOF ROOF STRUCTURE

Kenneth D. Detman, 357 Morgan Avenue, Mobile, Ala.

Filed Feb. 9, 1970, Ser. No. 9,770
Int. Cl. E04b 7/08, 1/32
U.S. Cl. 52—22 **16 Claims**



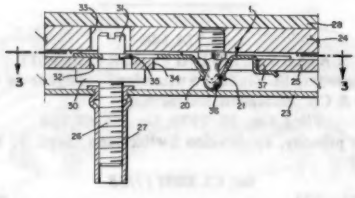
A domed roof formed by bolting or otherwise fastening together mostly identical prefabricated, preferably hexagonal pans. The pans may have solid tops or may have a central nozzle to accommodate a number of different covers to allow either ventilation, shade, both ventilation and shade, or neither ventilation nor shade, as required. Some variation in the pan shape may be required at the outer edges of the dome to suit the foundation or openings as doors or windows.

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

3,724,150
UNDERFLOOR ENTRANCE MEANS

Frederick W. Hudnall, Parkersburg, W. Va., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 858,906, Aug. 14, 1969, Pat. No. 3,648,559. This application Nov. 17, 1971, Ser. No. 199,624
Int. Cl. E04f 17/08
U.S. Cl. 52—221 **3 Claims**

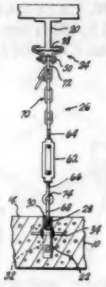


The combination of a fastener, tile trim or adjusting ring, cover and body of an underfloor trench, junction box, etc. The fastener rests on the tile trim or ring underneath the cover. The trim has a pair of openings. A pin secured to the body sticking up through one opening in the trim has a retaining groove flush with the trim surface. The fastener has a keyhole slot fitting in the retaining groove and also has a keeper fitting over the edge of the other trim opening. This holds the fastener.

3,724,151
MOBILE HOME ANCHOR

Roy H. Kaywood; Roy G. Kaywood, both of Stockbridge, Mich., and Keith P. Clayton, Jackson, all of Mich., assignors to Kaywood Products Corporation, Jackson, Mich.

Filed Jan. 18, 1971, Ser. No. 107,258
Int. Cl. E02d 27/32
U.S. Cl. 52—295 **10 Claims**

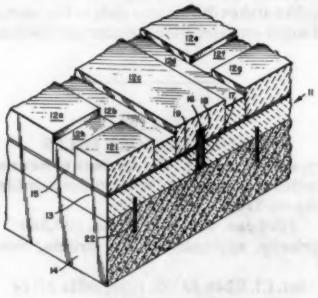


Anchor means for producing a downward holding force on mobile home frames to prevent the mobile home from shifting on its support and provide a stability beyond that achieved solely from the weight of the home. The anchor includes a base element adapted to be embedded in a concrete base and a clamp for attachment to the mobile home frame. Linearly adjustable tension producing means in the form of a turnbuckle and chain is interposed between the base element and the frame clamp.

3,724,152
MASONRY LAMINATE

Albert L. Castellarin, 67 Crescent Avenue, Revere, Mass.

Continuation-in-part of Ser. No. 4,671, Jan. 21, 1970, abandoned. This application Jan. 13, 1971, Ser. No. 106,037
Int. Cl. E04b 1/16, 5/04
U.S. Cl. 52—378 **6 Claims**



A masonry laminate comprising a facing sheet of architectural grade marble or granite or the like, a supporting member of suitable hard stone such as marble or granite and a backing member comprising a layer of concrete or a combination of

concrete and hollow blocks. The facing sheet which may optionally consist of several pieces is cemented to the supporting member by means of a thin layer of a high strength, non-shrinking, quick setting adhesive and the bond is reinforced by metal rods which pass through the supporting member and part way through the facing sheet.

3,724,153

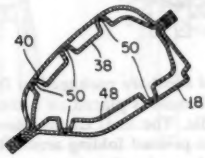
JOINT CONSTRUCTION

Henry W. Wessells, III, Paoli, and Walter S. Eggert, Jr., Huntingdon Valley, both of Pa., assignors to The Budd Company, Philadelphia, Pa.

Division of Ser. No. 842,279, July 16, 1969. This application Jan. 19, 1971, Ser. No. 107,762

Int. Cl. E04c *1/30, 3/32*

U.S. Cl. 52—588 **3 Claims**



A fabricated uniside unit for a unitized body structure having reinforced joint constructions utilizing small economical stampings doubled in high stress areas for greater strength and forming frustum reinforced beam sections at extremely stressed areas.

3,724,154

FIXING DEVICES FOR ROOFING AND SIDING SHEETS

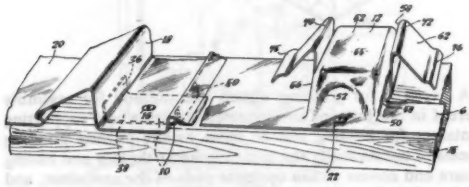
William Cookson, Fareham, England, assignor to Cookson Sheet Metal Developments Limited, Southampton, Hampshire, England

Filed Dec. 16, 1970, Ser. No. 98,554

Claims priority, application Great Britain, Dec. 23, 1969, 62,617/69

Int. Cl. E04d *3/36*

U.S. Cl. 52—543 **14 Claims**



A fixing device formed of sheet metal for securing roofing and siding sheets to a structural member has locating means to engage under a downwardly formed portion at the edge of one sheet, a strap having holes by which the device can be secured to a structural member, and clip means to enter a hollow rib of an adjacent sheet and latch into pockets inside the hollow rib. The strap joins the locating means to the clip means and serves to space the two a suitable distance apart.

3,724,155

METHOD FOR THE SEALING OF ROOF OR OTHER STRUCTURES

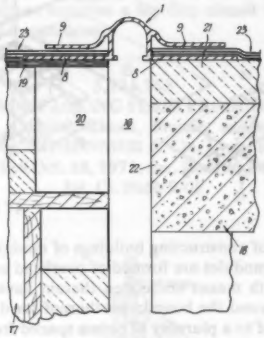
William Ernest Reeve, Huntingdon, England, assignor to Silent Channel Products, Limited, Huntingdon, England

Filed Jan. 4, 1971, Ser. No. 103,669

Claims priority, application Great Britain, Jan. 29, 1970, 4,423/70

Int. Cl. E04d *1/36, 3/366*

U.S. Cl. 52—741 **1 Claim**



The method involves arranging along a roof joint, a longitudinal sealing element having a flexible channel and, at each side of the channel, a base flange and a cooperating upper flange. Roofing felt or other sheet material is located between the flange which embrace and provide a seal for the sheet material. At the interconnections of the roof joints, there are arranged junction sealing elements having, like the longitudinal sealing elements, channel parts and adjacent side flange, the channel parts of the junction elements extending at right-angles are to another so as to correspond to the joint interconnections.

3,724,156

A LINING BOARD

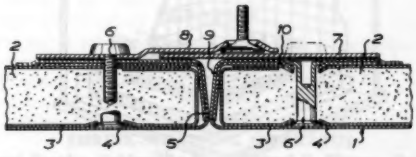
Per-Erik Helmerson, Huddinge, Sweden, assignor to Lectus AB, Stockholm, Sweden

Filed March 2, 1971, Ser. No. 120,219

Claims priority, application Sweden, March 9, 1970, 3059/70

Int. Cl. E04b *1/68*

U.S. Cl. 52—613 **3 Claims**



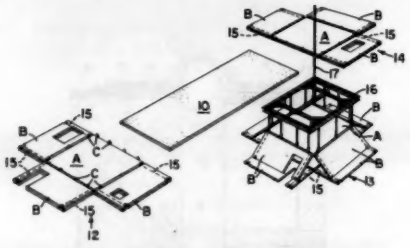
A prefabricated board, such as gypsum board or fiber board, with a facing of paper, fabric, plastics or like material affixed thereto, is provided with an edge corrector strip which is fastened along the edge of the board before the facing layer is adhered thereto. The strip preferably is of L-shape and one limb portion thereof lies flat against the rear side of the board while the other limb portion thereof lies along the edge face of the board, the facing material being wrapped or folded about the edge corrector strip.

3,724,157

METHOD OF MULTI-LEVEL BUILDING CONSTRUCTION

Oleg V. Miram, 759 Flood Building, San Rafael, Calif.

Filed April 16, 1971, Ser. No. 134,623
Int. Cl. E04g 21/14
U.S. Cl. 52—745 12 Claims



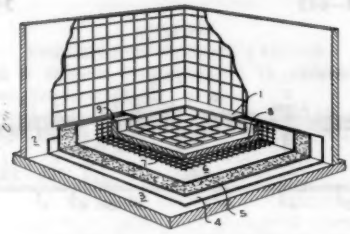
A method of constructing buildings of modules is disclosed in which the modules are formed of overhead and wall panels fabricated with means embedded therein having no portion extending beyond the boundaries thereof for distributing the weight thereof to a plurality of points spaced from each other along their edges, which edges are mechanically interconnected by removable hinge joinder means extending between the embedded means in adjacent panels when they are in selected juxtaposition. Means for raising the overhead panels to an elevated position including said removable hinge joinder means are described. Preferred means for forming the overhead and wall panels in the selected juxtaposition and preferred removable hinge joinder means are disclosed. Preferred methods and means for interconnecting vertically and horizontally adjacent modules into structural units of the final building structure before or after removal of said removable hinge joinder means are described.

3,724,158

METHOD FOR REPAIRING FLOORING CONSTRUCTION

Walter L. Knecht, 51 Cedar Street, Wilkes-Barre, Pa.

Division of Ser. No. 19,383, March 13, 1970, Pat. No. 3,675,384. This application Dec. 14, 1971, Ser. No. 208,012
Int. Cl. E04b 1/64
U.S. Cl. 52—743 5 Claims



A floor construction is provided which may be used as original installation or in the repair of leaking shower stalls, etc. The floor construction comprises a metal angle, placed at the bottom of the shower stall walls, and succeeding layers of asphalt mastic, waterproof fibrous material, wire lath, mortar and tile.

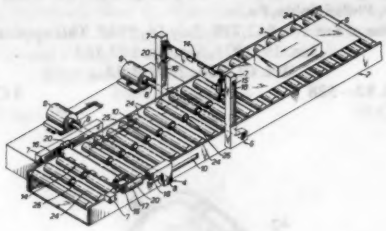
Also provided in connection with the repair of leaking shower stalls is a method for raising the drain so as to compensate for the raised level of the floor.

3,724,159

APPARATUS AND METHOD FOR PACKAGING

Geoffrey Ronald Reed, London, England, assignor to The British Iron and Steel Research Association, London, England

Filed April 13, 1971, Ser. No. 133,576
Claims priority, application Great Britain, July 21, 1970, 24,649/70
Int. Cl. B65b 11/02, 49/10
U.S. Cl. 53—3 10 Claims



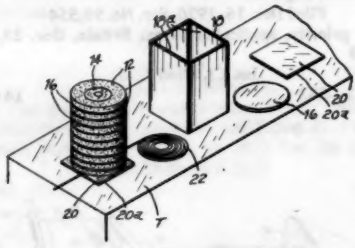
Bundles of steel sheet are packaged by folding a steel sheet around them. A bundle is placed on a sheet larger than the base of the bundle. The ends of the sheet are clamped by clamps carried on pivoted folding arms. Hydraulic cylinders tension the sheet by urging the clamps away from the pivoted ends of the arms. The arms are then moved so that the clamped ends of the sheet move up and over the end of the bundle so as to form fold lines in the sheet along the edges of the bundle.

3,724,160

METHOD OF PACKAGING GRINDING WHEELS

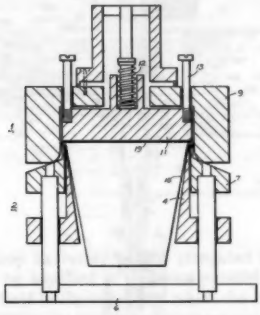
Franz F. Rechberger, Hamilton, Ontario, Canada, assignor to Norton Company, Worcester, Mass.

Division of Ser. No. 11,386, Feb. 16, 1970, Pat. No. 3,630,349. This application June 24, 1971, Ser. No. 156,522
Int. Cl. B65b 23/00, 13/00
U.S. Cl. 53—26 3 Claims



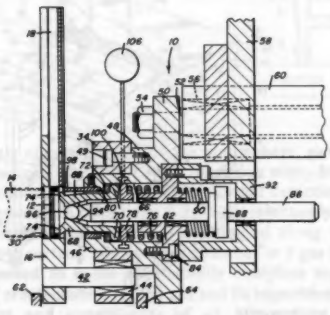
A package for grinding wheels and method for assembly thereof in the form of an elongated square wheel supporting container for holding one or more axially aligned grinding wheels of substantially the same diameter therein and having square end covers within opposite ends of the container, and tensioned tied strands of strapping extending across the end covers and axially along the center of each side of the container opposite a line of contact between the inside walls of the container and the wheels. Disclosed also, is a method of packaging grinding wheels by stacking and centering them upon an end cover. A square container of sufficient length is slipped over the stack endwise and another end cover is placed over the exposed end of the stack of wheels to fit within the tube. Strapping is then stretched tightly across the outside of the end covers and along the center of each side of the container to force the wheels together and each side of the container into contact with the periphery of each of the wheels.

3,724,161
CLOSURING CONTAINERS
Emile R. Vermeulen, Ghent, Belgium, assignor to Sidaplax N.V., Gentbrugge, Belgium
Continuation-in-part of Ser. No. 868,162, Oct. 21, 1969. This application Sept. 29, 1971, Ser. No. 184,697
Claims priority, application Great Britain, June 29, 1971, 30,386/71; Oct. 28, 1971, 51,058/68
Int. Cl. B65b 7/28
U.S. Cl. 53—42 11 Claims



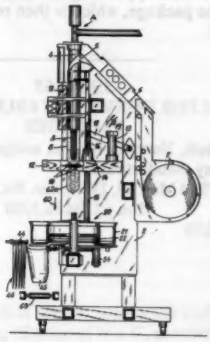
Improvements in closuring a container with a sheet of biaxially oriented thermoplastic resin by shrinking a portion of the sheet overlying the container mouth to tightly mechanically engage portions of the sheet which had been previously crimped under a peripheral lip on the container. The container, which may be of the thin walled variety, is supported by a holder during closuring in the vicinity of the peripheral lip to minimize the vertical load applied thereto.

3,724,162
MISALIGNED END CAP DETECTING MECHANISM FOR A CAPPING DEVICE
Raymond Lorenzini, and Richard I. Kinsella, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 23, 1971, Ser. No. 201,509
Int. Cl. B65b 57/18
U.S. Cl. 53—78 7 Claims



A detecting mechanism in a capping device of a spooling machine for detecting an improperly capped magazine by sensing a predetermined level of interference between a magazine and an end cap during the capping operation, and in response thereto actuating a control circuit for controlling several operations such as, among other things, inhibiting the operation of a staking mechanism, stopping the spooling machine including the capping device after it has completed a cycle of operation, opening a reject chute to receive the improperly capped magazine, and alerting the operator by actuating a signal device. Any interference between the end cap and magazine equal to or in excess of the predetermined level causes relative movement between the staking mechanism and a staking head which moves the staking mechanism to its staking position. Such relative movement causes leakage in a positive or negative fluid pressure system of the detecting mechanism resulting in a change in pressure which is sensed by a fluidic sensor of the detecting mechanism. The sensor is interrogated by an interrogating input in the form of a voltage pulse, and the interrogating pulse in combination with a change in pressure actuates a flip-flop circuit to initiate the aforementioned operations.

3,724,163
MACHINE FOR PACKING FLUID PRODUCTS IN BAGS
Jean Roussel, Caluire, Rhone, France, assignor to Societe Anonyme dite THIMONNIER & Cie, Lyon, France
Filed Oct. 18, 1971, Ser. No. 190,049
Int. Cl. B65b 9/08
U.S. Cl. 53—171 6 Claims



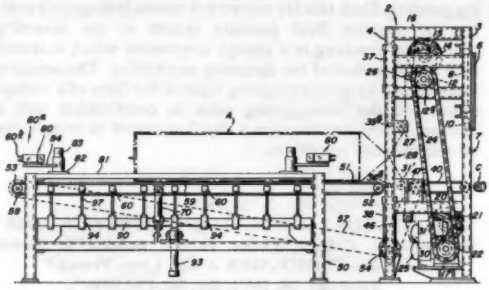
This machine comprises two parallel, spaced filling units and an overpacking assembly comprising a distributor having a plurality of equal radial compartments, a fixed bottom provided with an aperture, a frap door normally closing said aperture and means for opening an overpacking bag beneath said aperture so that the primary bag or bags deposited into said compartments can drop by gravity into an overpacking bag while separating by gravity said thus filled overpacking bag from its supporting means; this machine is advantageously utilized for all fluid products, notably liquid, pasty, pulverulent or granular products.

ERRATUM
For Class 53—186 see:
Patent No. 3,724,185

3,724,164
SHRINK-WRAPPING APPARATUS
Robert Brevko, Bridgeville, Pa.; Michael P. Bitsura, Duluth, Minn.; John R. Mucka, Pittsburgh, and Peter Zinski, Carnegie, both of Pa., assignors to Ruburn Engineering, Inc., Pittsburgh, Pa.
Filed July 17, 1970, Ser. No. 55,890
Int. Cl. B65b 11/48, 49/08, 51/14
U.S. Cl. 53—229 4 Claims

Apparatus is disclosed for wrapping an object or stack of objects in shrink wrap plastic sheets wherein an upper plastic sheet and a lower plastic sheet are brought together and heat seamed across their full width. The object to be wrapped is conveyed against the fused sheets and then moves on with the two sheets unwinding from their respective rolls, one being

under the object and the other draped over it. At the trailing end of the object, the two sheets are heat seamed together along spaced parallel lines and severed between the two lines. The margins of the bottom sheet ate folded up to overlap the



down-draped margins of the upper sheet at each side of the object and the overlapped edges tack-fused or welded along the sides of the package, which is then ready to be placed in a shrink tunnel.

3,724,165

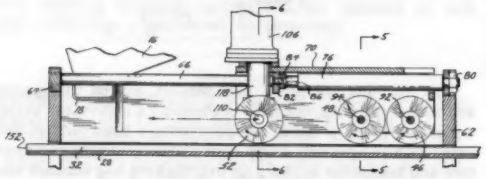
APPARATUS FOR INSERTING TABLETS INTO BLISTER PACKAGES

Matthew Nichols, Norristown, Pa., assignor to Sauter Packaging Company, Souderton, Pa.

Filed May 10, 1971, Ser. No. 141,762

Int. Cl. B65b *5/00*

U.S. Cl. 53—250 **6 Claims**



An apparatus for filling tablets into blister packages, including a lower assembly which provides a vibrating guide for directing elongate thermoplastic strips longitudinally through the apparatus. A movable carriage reciprocates above the lower assembly and carries a plurality of brushes in rotary contact with the top surface of the thermoplastic strips of material. A portion of said brushes are transversely disposed with respect to the elongate thermoplastic strips and are rotatively journalled within the carriage assembly. Other of said brushes circularly rotate with respect to the elongate strips and combine with the transverse brushes to thoroughly sweep the entire top surface of the strips to urge medicinal tablets and the like into depending blisters which are formed in the thermoplastic strips.

3,724,166

CLOSING SPINDLE

Leonardus Petrus van der Meer, Roelofsarendsveen, Netherlands, assignor to N.V. Leidsche Apparatenfabriek, Leiden, Netherlands

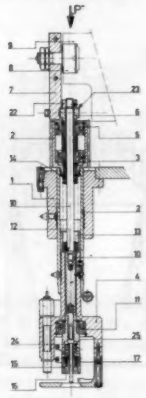
Filed March 16, 1971, Ser. No. 124,994

Claims priority, application Netherlands, Dec. 8, 1970, 7017856

Int. Cl. B65b *7/28*

U.S. Cl. 53—334 **7 Claims**

A closing spindle particularly for the application of bottle caps on pressurized bottles. The spindle comprises a cam for motion along a fixed cam track for taking up impact forces generated by the device. The cam is connected to a coupler moving along with the bottle to be capped. The coupler is integral with a spindle shaft and a telescopically movable spindle under the pressure of a spring. The spindle is prevented from rotating with respect to the spindle shaft and is surrounded by



the rotatable shaft. The rotatable shaft is provided with a telescopically movable shaft having means to force the bottle cap onto the bottle. The last mentioned movable shaft is prevented from rotating with respect to the rotatable shaft and is prevented from longitudinal motion with respect to the spindle.

3,724,167

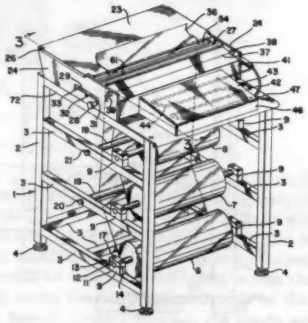
WRAPPING MACHINE

Frank Pizmoht, Willoughby, Ohio, assignor to Heat Sealing Equip. Mfg. Co., Cleveland, Ohio

Continuation of Ser. No. 493,075, Oct. 5, 1965. This application March 28, 1968, Ser. No. 717,049

Int. Cl. B65b *11/02, 11/04, 49/00*

U.S. Cl. 53—390 **11 Claims**



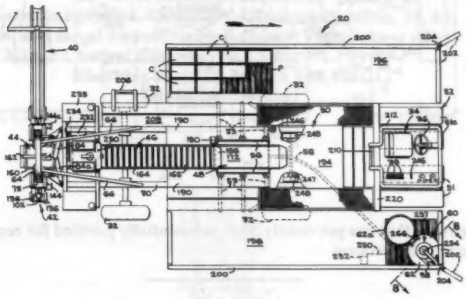
A machine to facilitate the wrapping of packages having a framework, rods attached to the framework for rotatably supporting a plurality of rolls of wrapping material and a platform on which the packages may be wrapped. An adjustable film selector, slidable under the platform, holds the ends of the wrapping material. Separators are utilized to isolate the different pieces of wrapping material from each other as they unwind from the rolls.

3,724,168

ROW CROP HARVESTING METHOD AND APPARATUS

Henry W. Cassady, Jr., San Jose, and Robert E. Stilwell, Santa Clara, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed June 21, 1971, Ser. No. 154,928
Int. Cl. B65b *67/02*
U.S. Cl. 53—3 **9 Claims**



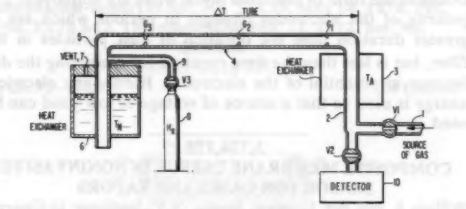
A row crop harvester having elongated boom conveyors which may be adjusted to positions parallel to the boundary roads of a field being harvested when the harvester is being driven parallel to the rows whether or not the rows are perpendicular or at an acute angle relative to the boundary roads. The boom conveyors are also horizontally and vertically adjustable to a transport position where they are directed rearwardly of the harvester and upwardly to an angle of about 30 degrees. The harvester further includes a sorting station, a packing station, a pallet unloading station, and a vacuum conveying system for rapidly but gently handling soft produce.

3,724,169

DELTA T BAR SPECTROMETER

Donald J. Santeler, Scotia, N.Y., assignor to Aero Vac Corp., Troy, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,602
Int. Cl. B01d *5/00*
U.S. Cl. 55—20 **35 Claims**



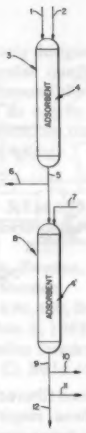
Analysis of constituents of the atmosphere, particularly in the range from 1 PPM to 1 PPB, requires a many-fold factor of concentration, such as 10^5, before normal detection and analysis measurement can occur. Gages are selectively condensed at temperatures in a gradient maintained along a thermally conductive surface in a vacuum chamber in a gas flowing at a rate adjusted to cause substantially complete separation of zones of condensation for the gas and its impurities or the contaminants and constituents of an atmosphere to be investigated. A temperature gradient is maintained along the exterior of a bar in a vacuum chamber or within a conductive tube through which the gas sample passes. Close control of gas flow diffusion rate, and condensing surface temperature is established between two fixed temperature points as in a tube cooled at one end by liquid nitrogen, for effective separation along the tube wall of constituents. Measurement of the composition of a flowing gas sample, after condensation, is effected through successive component evaporation either into a vacuum or into a carrier gas in a reverse flow to an apparatus such as a mass spectrometer, commencing at the low temperature end. The Δ T bar separates each of the constituents including trace contaminants in a gas to permit successive recovery of the purified or concentrated components in timed sequence according to a controlled temperature rise along the Δ T bar.

3,724,170

STAGED SEPARATIONS OF AROMATIC MIXTURES WITH ZEOLITES

Paul T. Allen; B. M. Drinkard, and Edward H. Unger, all of Beaumont, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 13, 1971, Ser. No. 179,917
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 **16 Claims**



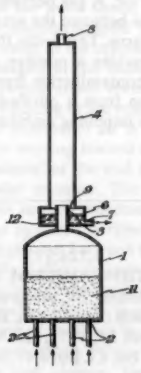
An improved method for the separation and isolation of individual components contained in a C_8 aromatic mixture such as a p-xylene and ethylbenzene, by contacting the mixture with an aluminosilicate zeolite in stages and recovering the components. It is preferred to use as the zeolite one which has been contacted with an organic-radical substituted silane to modify the characteristics of the zeolite.

3,724,171

ANNULAR FLOW CONDENSER

Wendell E. Dunn, Jr., Sydney, Australia, assignor to Wendell E. Dunn, Inc., Wilmington, Del.

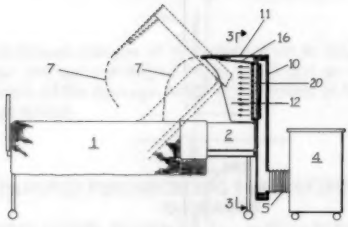
Filed April 29, 1971, Ser. No. 138,462
Int. Cl. B01d *53/00*
U.S. Cl. 55—71 **3 Claims**



This invention relates to a method of condensing iron chloride gases, particularly ferrous chloride, evolved from the

chlorination of titaniferrous ores to separate the ferrous chloride from other gases evolved from the reaction, by means of annular flow condensation incorporating refluxing of the condensate along the cooling walls in a direction countercurrent to the gas flow from the reactor.

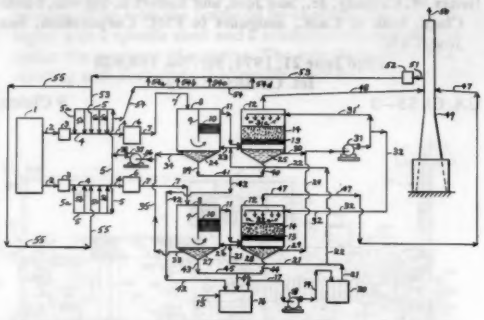
3,724,172
FILTERED AIR BREATHING ZONE
Walter Bruce Wood, 2106 Evergreen Road, Anchorage, Ky.
Filed June 16, 1971, Ser. No. 153,612
Int. Cl. B01d *46/00*
U.S. Cl. 55—97 19 Claims



A highly portable, localized filtered air breathing zone for a patient suffering from those respiratory diseases or who require protection from air borne contamination. The filtered air in which essentially all particulate matter has been removed provides a gaseous envelope in the breathing zone adjacent the top portion of the patient's bed. In another embodiment, the apparatus is arranged as to extend longitudinally of the bed and thus provide a patient zone extending transversely across the bed for essentially its entire length. The latter modification is to provide an essentially contamination free patient zone or breathing zone for intensive care units and for enclosures for small children requiring contamination free air. The patient zone is isolated from ambient air by means of three gas patterns, one formed at either vertical edge of the patient zone and one formed transversely across the top of the patient zone. These act as relatively high velocity air curtains and thus shield the center portion of the patient zone from the surrounding ambient air. A gas pervious diffusion wall is provided in the apparatus between the areas defined by the three high velocity gas patterns. This forms the center portion of the patient zone and provides a positive method for filling the breathing zone with contamination free filtered air. All of the air circulated is taken from a purified or filtered air source preferably derived by impelling ambient air through a high efficiency filter.

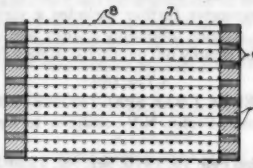
3,724,173
POLLUTION CONTROL PROCESS
Lloyd A. Fry, Sr., Hinsdale, Ill., assignor to Lloyd A. Fry Roofing Company, Summit (Argo P. O.), Ill.
Filed March 24, 1971, Ser. No. 127,500
Int. Cl. B01d *47/06*
U.S. Cl. 55—89 8 Claims

Process for substantially reducing the particulate emission, opacity and odor of an asphalt saturator effluent to form a substantially odor-free gas stream using an exhaust stack



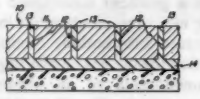
stream that has previously been substantially purified for recycle to the process.

3,724,174
ELECTRICALLY OPERATED DUST MASK
Wilhelm Walkenhorst, Bochum, Germany, assignor to Bergwerksverband GmbH, Essen-Kray, Germany
Filed Sept. 28, 1970, Ser. No. 76,033
Int. Cl. B03c *3/04*
U.S. Cl. 55—123 2 Claims



A breathing filter for dust filtering masks in which electrodes in the form of insulated metal wires are employed. The polarity of the electrodes changes in periods which are of greater duration than the duration of dust particles in the filter, but is less than the time required for equalizing the difference in potential of the electrodes. Hardly any electrical energy is used so that a source of voltage of low yield can be used.

3,724,175
COMPOSITE MEMBRANE USEFUL IN NONINVASIVE SENSOR FOR GASES AND VAPORS
Willem J. van der Grinten, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Aug. 5, 1971, Ser. No. 169,170
Int. Cl. B01d *53/22*; B29d *27/00*
U.S. Cl. 55—158 8 Claims



A two-phase membrane construction is described comprising a perforated substrate of essentially non-permeable material, each perforation of which is impregnated with solid polymer material. Means are also provided adjacent the surface of the substrate for equalizing the gas flux over the surface of the polymer-filled perforations. An exemplary two-

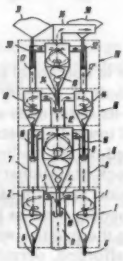
phase membrane in a membrane/vacuum/mass spectrometer combination is described for use in the non-invasive on-time treatment of gas and vapor partial pressures on the skin (or body membranes) of patients or in body fluids held in vitro.

3,724,176

DEVICE FOR HEAT TREATMENT OF FINELY DISPERSED MATERIAL

Konstantin Pavlovich Vishnevsky, Ulianovskaya ulitsa, 19, kv. 24, and Sergei Alexandrovich Belyanov, Vilonovskaya ulitsa, 13, kv. 32, both of Kuibyshev, U.S.S.R.

Filed May 19, 1971, Ser. No. 144,912
Int. Cl. B01d *51/06*
U.S. Cl. 55—269 **1 Claim**



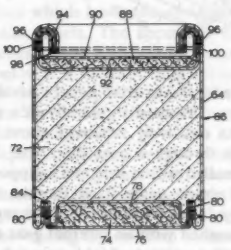
A device for heat treatment of finely dispersed material in which there are several stages of duplex and single cyclone-heat-exchangers with the last cyclone in the line serving as a precipitator and being of a multistage construction.

3,724,177

CARTRIDGE FOR FILTER FOR MOISTURE AND OIL VAPOR

George A. Grote, Glen Rock, Pa., assignor to National Central Bank of York, Pa. Administrator, d.b.n.c.t.a. of the Estate of Willard C. Beach, dec'd and Administrator c.t.a. of the Estate of Mary B. Beach, Hanover, Pa.

Continuation-in-part of Ser. No. 37,125, May 14, 1970, Pat. No. 3,678,662. This application Feb. 11, 1972, Ser. No. 225,382
Int. Cl. B01d *53/16*
U.S. Cl. 55—316 **14 Claims**



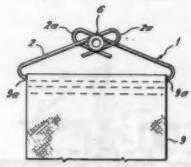
A cartridge for a filter system to absorb and separate water and oil vapors from gases comprising a cylindrical container connectable in a supply line for said gases and containing at least one such cartridge comprising a seamless cylindrical sleeve, the diameter of said sleeve being slightly greater than the inner diameter of said container so that when the filter unit is supported within said container the periphery of the sleeve will smoothly and tightly engage the inner surface of the container to prevent bypassing of gases between the sleeve and container during use.

3,724,178

SPRING HANGER

Joe S. LeBoeuf, Bakersfield, Calif., assignor to Continental Carbon Company, Houston, Tex.

Filed June 21, 1971, Ser. No. 154,909
Int. Cl. B01d *46/02*
U.S. Cl. 55—341 **2 Claims**



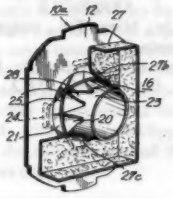
A wire hanger particularly designed for hanging a bag filter is of substantially triangular configuration with two overlapping loops extending beyond the apex of the triangle. The overlapping loops define an eye by which the hanger is supported. Each loop is slideable on the other so that the hanger also functions as a tension spring.

3,724,179

SELF-SEALING END CLOSURE FOR DISPOSABLE DUST BAG

Karl Eric Leinfelt, Solna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation of Ser. No. 690,490, Dec. 14, 1967, abandoned. This application Nov. 6, 1969, Ser. No. 871,639
Claims priority, application Sweden, Dec. 26, 1966, 1730/66
Int. Cl. B01d *46/02*
U.S. Cl. 55—367 **5 Claims**

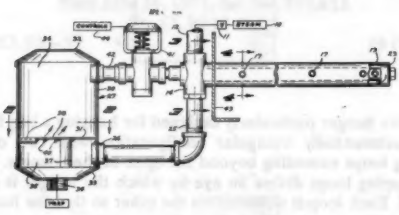


A self-sealing end closure for a disposable paper dust bag having superimposed outer and inner cardboard sheets, the inner sheet having an opening and tongues cut therefrom for holding one or more elongated rubber strips which are substantially in the plane of the inner sheet, and the outer sheet having a plurality of triangular-shaped flaps cut therefrom which overlie the inner sheet at the opening therein with their apices located approximately at the center of such opening. The flaps are forcibly swung about several fold lines in the outer sheet through the opening in the inner sheet by a tubular member through which dust-laden air is conducted into the paper dust bag, the flaps moving inward to provide a hole in the end closure, the material of the end closure defining the hole receiving the tubular member. The one or more elongated rubber strips resist inward movement of the flaps and resiliently hold the flaps against the tubular member to provide a substantially air-tight seal between these parts with first flap portions substantially in their entirety bearing against the outer surface of the tubular member and with second flap portions, which extend radially outward from the first flap portions, inclined to the plane of the plate by the action of a sealing gasket on the tubular member. When the tubular member is withdrawn from the end closure, the elongated rubber strips, which overlie the inner faces of the flaps, urge the flaps into the plane of the outer sheet to close the hole and effect self-sealing of the end closure.

3,724,180
STEAM HUMIDIFIER WITH CENTRIFUGAL SEPARATOR

Bernard W. Morton, Hopkins, and Willard E. Morton, Minneapolis, both of Minn., assignors to Environmental Industires Inc., Hopkins, Minn.

Filed Jan. 22, 1971, Ser. No. 108,706
Int. Cl. B01d *45/12*
U.S. Cl. 55—410 **4 Claims**

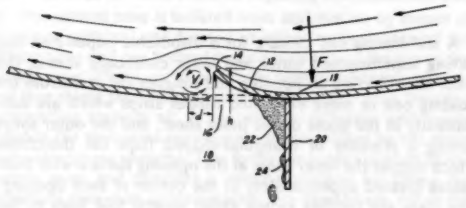


A steam humidifier used to maintain the relative humidity within a desired range in buildings which utilizes a dispersion tube that has a jacket through which the steam passes to keep the dispersion tube at steam temperature, and which has a centrificial separator in the input line to separate out water droplets or slugs of condensate so that no liquid is emitted from the dispersion tube with the steam.

3,724,181
PROCESS FOR SEPARATING PARTICLES FROM AEROSOLS

Harvey S. Benson, Jr., Mico, Tex., assignor to Envirco Corporation, San Antonio, Tex.

Filed June 11, 1971, Ser. No. 152,208
Int. Cl. B01d *45/12*
U.S. Cl. 55—432 **4 Claims**

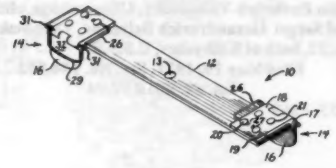


Apparatus for the removal of liquid or solid particles from an aerosol flowing through a conduit. A feature of the method and means for this invention is the provision of (a) a deflector baffle member arranged to divert the flow of the gaseous stream of said aerosol from a wall of the conduit and to cause the stream to pass over a lip of the deflector member whereby an area of turbulence is formed downstream from the deflector member, and (b) a passage provided through the wall of the conduit adjacent said lip and downstream therefrom. It is a discovery of this invention that highly efficient particle separation is achieved by the formation of such turbulent area, or vortex, behind the lip wherein particles are momentarily trapped and then caused to move through the passage into a collection chamber.

3,724,182
ROTARY LAWNMOWER ATTACHMENT

Marvin B. Long, 109 South 8th, and William A. Crowe, 807 West Main Street, both of Hamilton, Mont.

Filed July 6, 1971, Ser. No. 159,952
Int. Cl. A01d *75/18*
U.S. Cl. 56—10.4 **1 Claim**

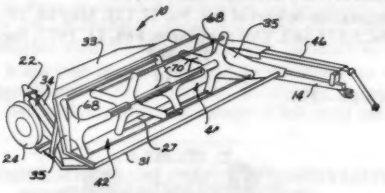


Removably mounted in horizontal attitude on the lower end of the vertical drive shaft of a rotary lawnmower is an elongated bar carrying on its outer ends a pair of hinged paddles which are spring-urged toward a substantially vertical attitude. The paddles are located on the trailing edges of the bar ends so that impact with a rock or stationary object will temporarily deflect the paddle against spring bias without damage to the paddle. The paddles, per se, serve as leaf, grass or loose snow blowers; and by fitting the paddles with one or more tines, a scarifying member is afforded, permitting the attachment to be used either to scrape hard snow and ice or to renovate lawns.

3,724,183
REEL DRIVE TRAIN

Joseph C. Hurlburt, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Continuation-in-part of Ser. No. 71,551, Sept. 11, 1970, Pat. No. 3,664,101. This application Dec. 30, 1971, Ser. No. 213,858
Int. Cl. A01d *47/00*
U.S. Cl. 56—14.3 **11 Claims**



A drive train adapted to drive a reel assembly having multiple reel sections. Disposed in side-by-side relationship, the reel sections are rotatively mounted about a main support tube and driven through a gear drive that includes a main drive shaft journalled within said main support tube and having a series of pinion gears fixed thereto and laying open through openings formed within said main support tube. Each pinion gear is meshed with an internal gear carried by a reel spider such that the rotation of said main drive shaft results in the simultaneous timed rotation of each reel section.

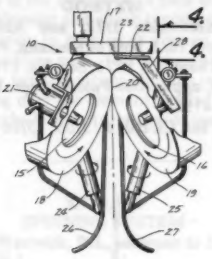
3,724,184
DETASSELING DEVICE

Jerry L. Wright, R.R. No. 2, Scronton, Iowa

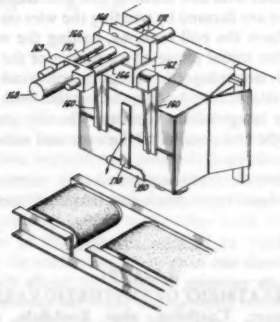
Filed Sept. 20, 1971, Ser. No. 182,034
Int. Cl. A01d *45/02*
U.S. Cl. 56—51 **6 Claims**

A device for removing tassels from corn stalks including a pair of rotatable wheels mounted at an angle with respect to

one another and forming a gripping surface at an area contiguous to the pair of wheels. The pressure at the gripping surface is controlled by an adjustable hinge mounting one of the wheels. Leaf depressing rollers activated by contact with the rotating wheels are provided.



3,724,185
PACKING STATION FOR FOLDABLE CARTON HANDLING APPARATUS
Joseph C. Berney, 2700 Peterson Way 22B, Costa Mesa, Calif.
Filed Sept. 8, 1970, Ser. No. 70,460
Int. Cl. B65b *43/28*
U.S. Cl. 53—186 **9 Claims**

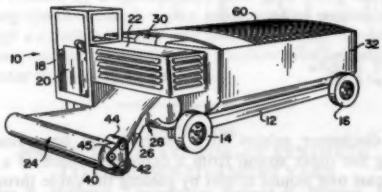


An automatic carton handling apparatus for erecting foldable cartons and positioning them adjacent to a packing machine of the kind which loads the cartons while they are resting on their side panels. The apparatus includes a feed magazine which feeds carton blanks from a stack to a loading station disposed below it, a reciprocating carriage for moving carton blanks from the loading station to a forming station, an opening mechanism for forming the cases into an essentially rectangular tubular configuration, pivotable arms for closing the bottom end flaps, rectilinear arms for closing the bottom side flaps, and a retractable pusher arm associated with the carriage for transferring the opened case from the forming station to a packing station. Included at the forming station is an arm for opening the leading top end flap of the opened carton and a flap flange for maintaining the flap in its opened position. The packing station has associated with it a pivoting carton positioning arm which pushes the opened carton against an end stop, an angular flanged packing horn, carton transfer arms for pushing the opened carton off the carriage onto the packing horn and a lowering arm which contacts the bottom of the carton on the packing horn and lowers the carton after it has been filled, to place the carton in an upright position on a conveyor. The apparatus is synchronized to sequentially feed the cartons in a downstream manner so that the cartons are opened, packed with canned goods, and moved downstream.

3,724,186
LAWN MOWER GRASS BAG HAVING A LITTER POCKET
Charles A. Mattson, Oak Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed March 3, 1971, Ser. No. 120,443
Int. Cl. A01d *35/22*
U.S. Cl. 56—202 **11 Claims**

A grass collection bag assembly for receiving the cut grass clippings is releasably mounted on a rotary power mower in register with the mower discharge chute. The assembly includes a bag which is provided with a closable opening for disposing of the collected clippings. A litter pocket opening is also provided on the bag for receiving objects or debris which the lawn mower operator has picked up by hand. The pocket opening is designed such that the items deposited therein may be disposed of at the same time the collected grass clippings are emptied from the bag. In one embodiment, a pocket separate from the grass clipping retaining portion of the bag is provided, while in other embodiments the pocket opening communicates directly with the grass clipping retaining portion of the bag, and the items deposited therein intermingle with the collected grass clippings.

3,724,187
ORGANIC DISPOSAL MACHINE
Loomis O. Bunker, 4338 Newcomer Road, Kent, Ohio
Filed Nov. 11, 1971, Ser. No. 197,805
Int. Cl. A01d *43/02, 87/00*
U.S. Cl. 56—361 **9 Claims**



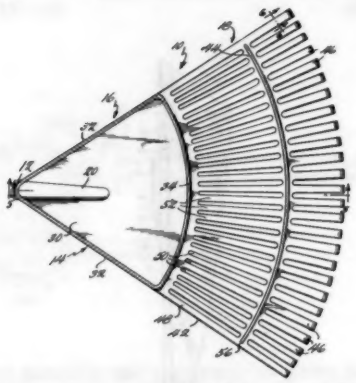
A self-contained machine for gathering organic materials such as leaves or grass clippings from the ground, pulverizing such materials and mixing them with water to form a slurry and dispensing the slurry as a fertilizer. A method for disposing of such organic materials is also disclosed.

3,724,188

LEAF RAKE WITH IMPROVED MOLDED HEAD

Harold O. Eads, Parkersburg, W. Va., assignor to McDonough Co., Parkersburg, W. Va.

Filed May 23, 1972, Ser. No. 256,166
Int. Cl. A01d 7/00
U.S. Cl. 56—400.17 14 Claims



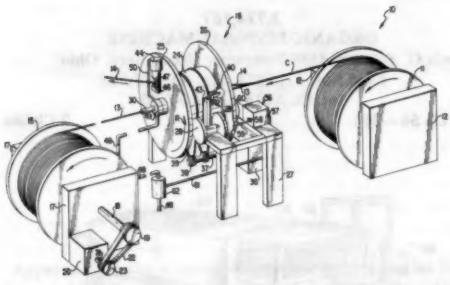
A leaf rake of the tine type comprising a rake head molded of polypropylene or the like as an integral unitary structure including a handle part of rigid ribbed panel construction providing a centrally located socket for receiving the end of the rake handle and a tine part having an intermediate portion provided with openings and tapered ribs to insure outwardly increasing flexibility, the intermediate portion terminating in a band section disposed within the outer half of the tine part which also includes a series of flexible L-shaped tines extending from the band section.

3,724,189

METHOD AND APPARATUS FOR STRIPPING CABLE

Dwight Bishop, Hawesville, Ky., and Ronald W. Baskin, Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed May 27, 1971, Ser. No. 147,468
Int. Cl. D01h 1/00
U.S. Cl. 57—2.5 25 Claims



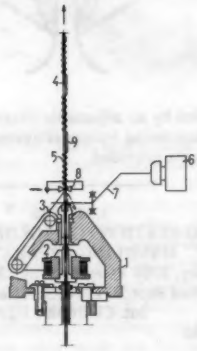
This disclosure relates to a method and apparatus for stripping the outer strand from a cable composed of a core and at least one wound strand by passing the cable through a rotating member with the core being drawn through a passage extending along the axis of rotation and the partially unravelled outer strand being drawn through another passage offset from the axis of rotation. The outer strand is unwound by being rotated about the core while simultaneously being drawn through the rotating member. A pneumatic shear timed in accordance with the rotation of the rotating member severs predetermined sections of the unwound outer strand.

3,724,190

METHOD OF PRODUCTION OF MULTISECTIONAL FILAMENT COILS AND CONTROL SYSTEM OF A COILING MACHINE OPERATING ACCORDING TO THIS METHOD

Jan Balbatun, Szenwalda 1/22, and Antoni Makarewicz, Gwardii Ludowej 13/3, both of Koszalin, Poland

Filed Sept. 13, 1971, Ser. No. 179,974
Claims priority, application Poland, Sept. 12, 1970, 143163; April 13, 1971, 147554
Int. Cl. H01b 13/00, 13/08
U.S. Cl. 57—18 8 Claims



Filament coils with coil sections and intermediate section of a straight wire are formed by winding the wire onto an advancing core to form the coil sections, halting the winding of the wire during the initial phase of formation of the intermediate sections and reversing the direction of wind of the wire through a predetermined angle during the final phase of formation of the intermediate sections. Thereby the wire will be formed straight and parallel to the core and substantially free of stress. The drive of the core and wire are controlled by an electronic control system equipped with counters regulating the number of coil turns, pitch, and length of intermediate sections.

3,724,191

TREATMENT OF SYNTHETIC YARNS

Norbert Hooper, Castleton, near Rochdale, and Terence Gurnshaw, Accrington, both of England, assignors to T.M.M. (Research) Limited, Lancashire, England

Filed Dec. 14, 1970, Ser. No. 97,969
Claims priority, application Great Britain, Dec. 16, 1969, 61,237/69
Int. Cl. D01h 13/28; D02j 13/00
U.S. Cl. 57—34 HS 23 Claims

In a method of treating a synthetic yarn, the yarn is advanced over a heat transfer element by the passage of the yarn

at one end or at each end of the element over guide means which causes a reversal of the direction of travel of the yarn over the element and a transfer of the yarn from a path in contact with one side of the element to a path in contact with the other side of the element and which is stationarily arranged or arranged in operation to revolve at a speed less than that of the contacting traveling yarn. The yarn upon leaving the element is twisted by twisting means with the twist running back to the yarn passing over the element beyond the guide means or beyond at least the last contacted guide means.

3,724,192

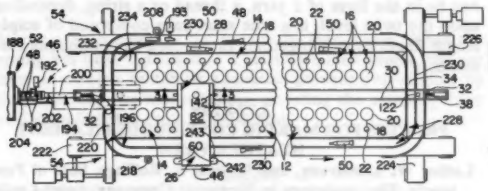
SPINNING SYSTEM

John V. Cardoz, Warwick, R.I., assignor to Lessona Corporation, Warwick, R.I.

Filed April 30, 1971, Ser. No. 138,900

Int. Cl. D01h *13/26*

U.S. Cl. 57—34 R **3 Claims**



An automatic spinning system has at least one spinning frame with opposite banks of spinning stations. A tractor carries a tender capable of randomly servicing the spinning stations. The tractor is mounted for back and forth movement between opposite ends of a track above the banks of spinning stations. The tender is mounted on the tractor for swinging movement about the ends of the spinning frame from one of the banks of spinning stations to the other bank when the tractor is at either of the opposite ends of its track. Thus, the tender patrols the stations as it travels in one direction along a continuous path about the banks of spinning stations, and is capable of randomly servicing the spinning stations. Either a broken strand of yarn or a full bobbin at a station requiring servicing is sensed by operating mechanism for stopping the tender in servicing orientation with the station requiring servicing, whereupon the tender doffs the bobbin from the station spindle and donns an empty bobbin and starts the strand winding onto the empty bobbin. Empty bobbins are conveyed to the tender and filled bobbins are conveyed from the tender as they are doffed. If desired, the tender may be equipped with a system for ridding the spinning frame of lint.

3,724,193

Patent Not Issued For This Number

3,724,194

TEXTILE SPINNING MACHINES

Robert Greenwood, Whalley, near Blackburn, and John Michael Shepherd, Ilkley, both of England, assignors to T.M.M. (Research) Limited, Lancashire, England

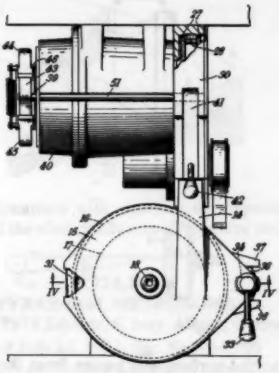
Filed July 8, 1970, Ser. No. 53,247

Claims priority, application Great Britain, July 8, 1969, 34,331/69

Int. Cl. D01h *1/12*

U.S. Cl. 57—156 **2 Claims**

A method of open end spinning textile yarns from fibers having a mean staple length of 2 inches or more using a spinning rotor, in which discrete fibers are fed to the interior fiber collecting surface of the spinning rotor through a feed



passage having a length greater than the mean staple length of the fibers.

3,724,195

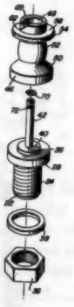
SPINDLE ASSEMBLY FOR TEXTILE MACHINE

William S. Moore, 5 Parkway Drive, Rome, Ga.

Filed Sept. 10, 1971, Ser. No. 179,483

Int. Cl. D01h *7/52*

U.S. Cl. 57—75 **10 Claims**



A spindle assembly for a yarn spinning or twisting machine consisting of a stator secured to the spindle rail of the machine in a stationary manner and a rotor rotatably mounted on the stator rotated by a spindle tape with yarn being fed from a drafting system through a yarn guide, around a spinning ring, through a rotating traveler and into a slot at the upper end of the rotor and then down through a hollow tube forming part of the stator to a takeup mechanism.

3,724,196

HIGH SPEED TEXTURING OF SYNTHETIC CONTINUOUS FILAMENT YARN

Charles E. Holland, Lincolnton; Robert E. Hinson, Jr., and Richard V. Putnam, both of Charlotte, all of N.C., assignors to Celanese Corporation, New York, N.Y.

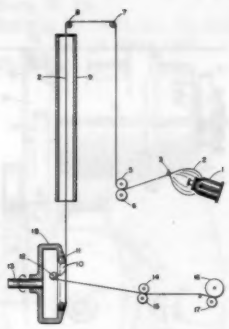
Filed May 28, 1970, Ser. No. 41,436

Int. Cl. D02g *1/04*

U.S. Cl. 57—77.4 **11 Claims**

A filamentary yarn is false twist textured by being heat set in a twisted configuration. The twist is imparted to the yarn by contact with the inner surface of a rotating friction insert hav-

ing a profiled friction surface, the insert being mounted in a rotatable cup. The threadline contacts the friction surface at



an angle to the surface and passes from the friction surface through a guide and out of the interior of the friction insert.

3,724,197
METHODS OF AND APPARATUS FOR DRAWTWISTING TEXTILE YARNS OR FILAMENTS

Hector Scowcroft, Bolton, England, assignor to T.M.M. (Research) Limited, Lancashire, England

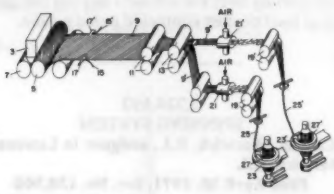
Filed Oct. 19, 1970, Ser. No. 82,017
Claims priority, application Great Britain, Oct. 20, 1969, 51,390/69
Int. Cl. D01h *1/26*
U.S. Cl. 57—93 **18 Claims**

A method and apparatus for drawtwisting textile yarns or filaments wherein the yarns or filaments are drawn in a drawing zone and then wound by a ring and traveller upon a rotating bobbin carried by a driven spindle to form a wound package, the diameter of which continuously increase during the winding operation. A predetermined spindle speed program drives the spindle initially at a speed lower than an predetermined maximum spindle speed at the commencement of a package build, gradually increases the spindle drive speed to said maximum speed during an initial portion of the build, and then gradually decreases the spindle drive speed throughout the whole of, or a part of, the remainder of the package build.

3,724,198
METHOD FOR PREPARING SPUN YARNS

Charles W. Kim, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 10, 1970, Ser. No. 53,718
Int. Cl. D02g *3/22*
U.S. Cl. 57—140 R **8 Claims**



Spun strands are prepared by fibrillating a striated film having striations disposed at an angle to its transverse angle and twisting the resulting fibrillated product. The strand, which can be in the form of a yarn, a thread or a string, depending upon the twist level, is a true spun yarn composed of staple length fibers twisted together, as opposed to continuous filaments.

3,724,199
PROCESS FOR MAKING CONTINUOUS FILAMENT HEATHER YARN

Luther W. Armstrong, and William A. Rollings, both of Pensacola, Fla., assignors to Monsanto Company, Saint Louis, Mo.

Filed April 20, 1970, Ser. No. 29,981
Int. Cl. D02g *1/16*
U.S. Cl. 57—157 S **2 Claims**

Doubled spun yarns having different dye receptivities are drawn simultaneously to the same degree, plied by filament intermingling, and wound on a package. This produces a heather type yarn.

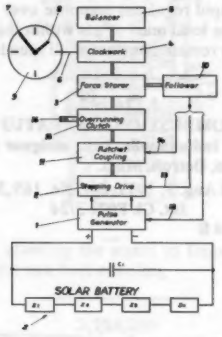
3,724,200
ELECTRONIC CLOCK WITH LOW POWER CONSUMPTION

Siegmar Donner, Augsburg-Spichel, Germany, assignor to Firma Kleninger & Obergfell, Georgen, Germany

Filed Feb. 1, 1971, Ser. No. 111,264
Claims priority, application Germany, Jan. 30, 1970, P 20 04 076.0
Int. Cl. G01c *9/00*; G04b *9/02*
U.S. Cl. 58—41 R **21 Claims**

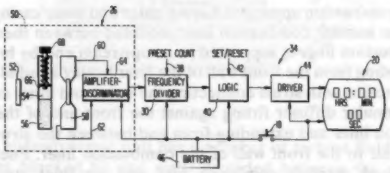
An astable multivibrator, driven by a solar battery or other long-term current supply, pulses an electromagnetic stepping

drive for intermittently winding up a coil spring which powers a mechanical clockwork. The spring, connected to its stepping drive via a one-way coupling permitting manual rewinding, has one end secured to a leadscrew and has its other end tied to a nut thereon so that the degree of unwinding is indicated



by the axial position of the nut on the lead screw. When the spring has been tightened to a predetermined extent, the nut trips an electric switch or a lever to prevent overwinding by disconnecting the multivibrator, arresting the stepping drive or decoupling that drive from its load.

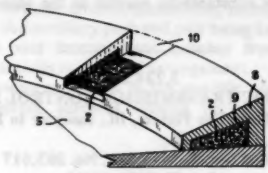
3,724,201
NUCLEAR-PACED SOLID STATE WRISTWATCH
John M. Bergey, Lancaster, Pa., assignor to HMW Industries, Inc., Lancaster, Pa.
Filed Jan. 27, 1971, Ser. No. 110,167
Int. Cl. G04b *19/30*; G04c *3/00*
U.S. Cl. 58—50 R **14 Claims**



Disclosed is a solid state wristwatch incorporating a nuclear timing source. A radioisotope such as Radium 226 decays, producing alpha particles that are detected and converted into electrical pulses of constant frequency. The electrical signals are divided in a CMOS binary chain and used to drive a digital time display of light emitting diodes. The watch is powered by a conventional 3 volt battery.

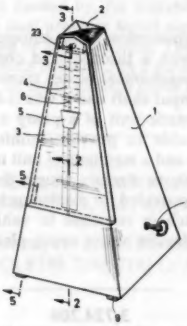
3,724,202
RING MEMBER FOR A WATCH DIAL
Gilbert Feller, Le Locle, Switzerland, assignor to Metalem S.A., Le Locle, Switzerland
Division of Ser. No. 79,778, Oct. 12, 1970, Pat. No. 3,675,295. This application Dec. 29, 1971, Ser. No. 213,583
Claims priority, application Switzerland, Oct. 14, 1969, 15353/69
Int. Cl. G04b *19/06*
U.S. Cl. 58—127 R **9 Claims**

A ring member possessing decorative or functional markings for an article, especially for use in a watch, wherein there is provided a metallic ring member body equipped with at least one substantially ring-shaped groove at its base portion which is not exposed to the observer of the article. At least one electrically non-conductive material is deposited in such groove, and the surface of the ring member is provided at



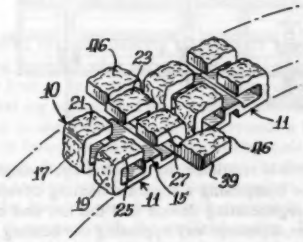
predetermined locations with openings for exposing at least given portions of the electrically non-conductive material.

3,724,203
PYRAMIDAL METRONOME
Rudolf Wittner, 7972 Johnstr. 6, Isny, Allgau, Germany
Filed July 21, 1971, Ser. No. 164,700
Claims priority, application Germany, July 22, 1970, P 20 36 319.3
Int. Cl. G04f *11/02*
U.S. Cl. 58—130 R **13 Claims**



A generally pyramidal cabinet for a metronome is formed by a molded truncated pyramidal body portion having appropriately arrange d integrally formed elements coacting with a cap portion, a base portion and a cover portion to hold the cabinet together without the use of additional fasteners.

3,724,204
FLEXIBLE CHAIN FOR PERSONAL WEAR
William N. Frederick, 1858 North Sedgwick, Chicago, Ill.
Filed Oct. 15, 1971, Ser. No. 189,693
Int. Cl. F16g *13/00*
U.S. Cl. 59—80 **5 Claims**



A chain useful as a bracelet and necklace comprised of a plurality of independent link members and coupling bars

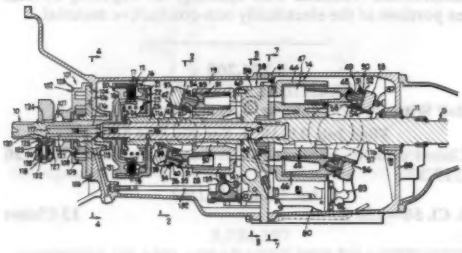
linked to provide a flexible chain of attractive appearance and having no clasp. A coupling bar can be inserted past a constriction in the link member only when the plane of the coupling bar is substantially normal to the plane of the link member.

3,724,205

AUTOMATIC TRANSMISSION CONTROL SYSTEM

Irving H. Hallberg, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 1, 1971, Ser. No. 203,617
Int. Cl. F02b *41/00*
U.S. Cl. 60—19 **17 Claims**



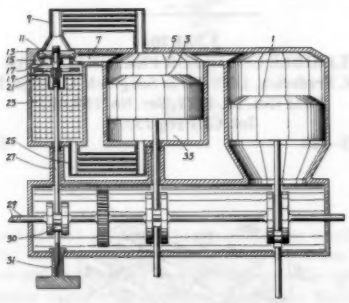
An automatic transmission for an automotive vehicle having a driving engine with a throttle, and comprising a variable speed ratio hydromechanical power transmission connecting an engine-driven input shaft and a wheel-driving output shaft including a hydrostatic unit of a pump and a motor having swash plates movable to provide infinitely variable speed ratios of the shafts and a mechanical unit in the form of a friction clutch operable to directly couple the shafts. Hydraulic control means are provided for displacing the swash plates and operating the clutch in response to vehicle speed, throttle operation, and hydraulic motor swash plate angular displacement.

3,724,206

SPEED CONTROL APPARATUS FOR HOT GAS ENGINE

Melvin Andrew Ross, 37 West Broad, Suite 630, Columbus, Ohio

Filed Jan. 12, 1972, Ser. No. 217,314
Int. Cl. F02g *1/06*
U.S. Cl. 60—24 **7 Claims**



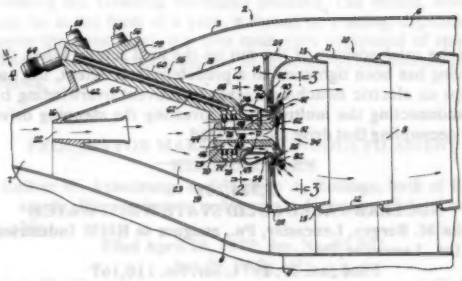
A speed control regulator for a closed-cycle displacer type hot gas engine comprising a separate heating device situated between the regenerating device and the hot end of the displacer cylinder, a passageway bypassing the heating device by leading directly from the regenerating device into the hot end of the displacer cylinder, an externally controlled variable valve which determines what portion of the working gas, if any, will bypass the heating device when being transferred into the hot end of the displacer cylinder, and nonvariable valves which allow all of the working gas to bypass the heating device when being transferred out of the hot end of the displacer cylinder. The hot end of the displacer cylinder is provided with insulation, becoming a mere repository for hot gas, as opposed to an externally heated adjunct to the heating device, in order to obtain rapid regulator response over a wide range of engine speeds. The total mass of gas within the engine's working chambers may remain constant at all speeds.

3,724,207

COMBUSTION APPARATUS

Douglas Johnson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1971, Ser. No. 169,307
Int. Cl. F02c *3/24*
U.S. Cl. 60—39.74 R **2 Claims**



A combustion apparatus having outer and inner casing walls and an annular combustion liner mounted between them. The combustion liner is supported at its upstream end by brackets extending from the front wall of the liner having a radial slip fit connection with struts connecting the outer and inner casings. An annular diffuser fitting against the front end of the combustion liner and extending from and between the struts supplies air to the front wall of the combustion liner. Fuel is introduced through combined fuel and air inlet structures spaced around the front wall of the liner, these having an outer air entrance, an intermediate mixed fuel and air entrance, and an inner air entrance all flaring at the inner side of the combustion liner front wall to direct the entering air and fuel generally radially from these entrances.

3,724,208

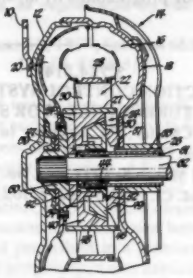
FRICTION DEVICE FOR HYDRODYNAMIC UNIT ROTOR

Earl S. Welch, Huntington Woods, and Roland J. Petelka, Ypsilanti, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed April 2, 1971, Ser. No. 130,584
Int. Cl. F16d *31/06*
U.S. Cl. 60—54 **4 Claims**

Hydrodynamic torque converter in which the stator is mounted on a cone-type friction device having a first cone member fixed to a ground sleeve and a second cone member which carries the stator. The second cone member is supported on the first cone member and is moved into and out of frictional engagement in accordance with the flow conditions within the converter. At stall and up to coupling, the flow of fluid through the converter acts on the front faces of the stator blades to provide a force which effects the frictional engagement of the friction device so that the stator is grounded to provide for reaction and torque multiplication. As turbine

speeds increase to pump speed, the fluid exiting from the turbine flows against the rear faces of the stator blades removing



the apply force allowing the stator to freewheel so that the converter operates as a fluid coupling.

3,724,209

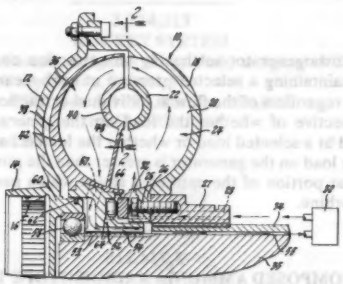
FLUID UNIT WITH DUMP AND FILL CONTROL

Harry Fackenthal, Muncie, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 22, 1971, Ser. No. 191,604

Int. Cl. F16d *33/06*

U.S. Cl. 60—54 **5 Claims**



This hydrodynamic unit has a number of turbine fluid flow passages blocked by end walls provided between the vanes and these passages are connected by internal radial passage within the unit leading to a central discharge line. The unit will evacuate its oil by the direct tapping of the toric oil flow in the unit in response to the decrease in supply of oil to the unit torus from the controls. By controlling the amount of oil fed to the unit torus, the torque transmitting capacity of the unit is controlled.

3,724,210

PUSH ROD MECHANISM FOR PARALLEL CYLINDERS

Uichiro Kobashi, and Masahiro Kito, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 18, 1971, Ser. No. 116,365

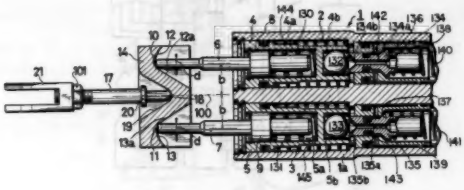
Claims priority, application Japan, Feb. 20, 1970, 45/15087; May 27, 1970, 45/52005

Int. Cl. F15b *7/00*

U.S. Cl. 60—54.6 E **6 Claims**

This invention relates to a push rod type motion-transmitting mechanism including a main push rod and a pair of auxiliary push rods, said main push rod being mechanically connected with a foot-operated brake pedal and said auxiliary rods being operatively connected respectively with control pistons slidably mounted in dual and parallel control cylinders formed within a hydraulic brake pressure control assembly adapted for valvingly control the hydraulic pressure supply to automotive wheel brake cylinders through dual pressure supply means leading thereto. All the main and auxiliary push rods are arranged in parallel to each other. There is provided a floating intermediate motion-transmitting member, said main push rod and the auxiliary push rod pair being kept in pressure contact with said intermediate member from both sides thereof substantially in opposed arrangement.

The improvement resides in the specific configuration of rod end-receiving surfaces formed on said intermediate



member, so as to transmit motion from said intermediate member to said auxiliary push rods substantially in the axial direction, regardless of occasional inclination or partial rotation of said member caused by, for instance, accidental disabling of one of the dual pressure liquid supply means on account of pipe bursting or the like cause. The specific configuration of the said surface is defined by a pseudo-involute curve situated inwardly of an ideal involute curve as a main working part of said surface.

3,724,211

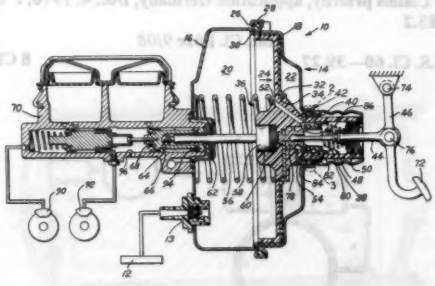
REAR SEAL FOR SERVOMOTOR

Thomas M. Julow, South Bend, Ind., assignor to The Bendix Corporation

Filed June 30, 1971, Ser. No. 158,327

Int. Cl. F15b *7/00*; F16j *15/18*

U.S. Cl. 60—54.6 P **4 Claims**

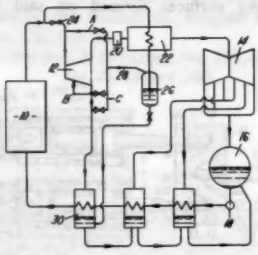


A combined seal and bearing member for aligning a force transmitting member of a servomotor. A U-shaped retainer frictionally held in an opening of the housing of the servomotor has a first leg surrounded by a resilient member. A hinged lip attached to the resilient member surrounds a tubular projection of the force transmitting member and seals the opening in the housing. A resilient wedge adjacent the first leg has its apex near a second leg of the U-shaped retainer. The second leg holds the bearing member which surrounds the tubular projection in contact with the resilient wedge. The resilient wedge will permit the bearing member to move transversely inside the retainer to align the tubular projection with the rear bearing of a power piston of a master cylinder.

3,724,212
POWER PLANTS

Alan Bell, London, England, assignor to Foster Wheeler John Brown Boilers Limited, London, England

Filed Nov. 26, 1969, Ser. No. 870,576
Int. Cl. F01k *13/00, 7/44*
U.S. Cl. 60—73 **9 Claims**

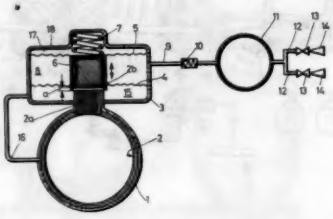


This invention relates to steam power plants where the generated steam is used to drive a turbine so providing power. In order to reheat the steam at an intermediate point in the turbine, the steam is removed from the turbine, dried if required, reheated in heat exchange with a substantial excess over that which will condense of the live steam, and then returned to the turbine. The live steam is derived from the same source as that used to feed the turbine and, after being used to reheat the steam from the turbine, the excess steam is separated from the condensed water, and both the steam and water are used in the power plant so as not to waste them.

3,724,213
FUEL SYSTEM, IN PARTICULAR FOR ROCKET ENGINES

Wolfgang Muller, Mockmuhl, and German Munding, Bad Friedrichshall, both of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Ottobrunn near Munich, Germany

Filed Dec. 3, 1971, Ser. No. 204,648
Claims priority, application Germany, Dec. 4, 1970, P 20 59 583.2
Int. Cl. F02c *9/08*
U.S. Cl. 60—39.27 **8 Claims**

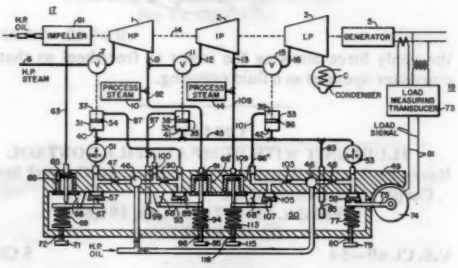


The fuel system includes a series connection of a fuel reservoir, containing at least one monergolic fuel, a catalyst for fuel decomposition, and a decomposition gas chamber. There may be two or more such series connections depending upon the number of monergolic fuels involved. A multi-part capillary body is interposed between each fuel reservoir and the catalyst, and at least one part of each capillary body is mounted for displacement in a direction to control the flow cross-sectional area for the fuel. The movable capillary body part may be suspended inside a housing by means of a control diaphragm subjected to the prevailing decomposition gas pressure, on one side, and to a counterpressure, such as a spring pressure, on the other side. Both the catalyst and the movable capillary body part may be suspended by two diaphragms forming a chamber for the decomposition gases escaping from the catalyst. Alternatively, the movable part of the capillary body may be a slide programmed by mechanism controlled by cams.

3,724,214
EXTRACTION CONTROL SYSTEM FOR A TURBOGENERATOR SET

Ozro N. Bryant, Chester, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 5, 1971, Ser. No. 121,317
Int. Cl. F01k *13/02, 17/02, 7/16*
U.S. Cl. 60—73 **7 Claims**

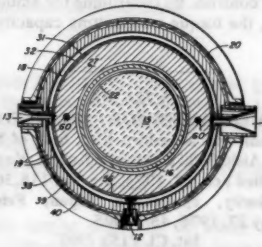


A turbogenerator set having an extraction control system for maintaining a selected pressure at each steam extraction point regardless of the flow at individual extraction points and irrespective of whether the load on the generator is maintained at a selected load or whether the load is varied, as long as the load on the generator is greater than the power supplied by that portion of the extracted steam which passes through the turbine.

3,724,215
DECOMPOSED AMMONIA RADIOISOTOPE THRUSTER

Joseph W. Neudecker, and Kenneth C. Cooper, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 19, 1971, Ser. No. 144,954
Int. Cl. F02k *11/00*
U.S. Cl. 60—203 **4 Claims**



A radioisotope heated propellant reaction control system wherein energy from the decay of plutonium-238 is used to heat and decompose ammonia propellant, and the decomposition products, nitrogen and hydrogen, are expanded through nozzles to provide desired increments of thrust. Three nozzles provide thrust levels of 10×10^{-3} to 100×10^{-3} lb_f at a specific impulse of 310 seconds in a pulsing mode.

3,724,216
COMBINED ROCKET-RAM-JET AIRCRAFT

E. Quimby Smith, Jr., Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy

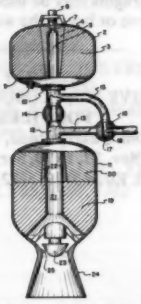
Filed June 13, 1957, Ser. No. 665,612
Int. Cl. F02k *3/00*
U.S. Cl. 60—245 2 Claims

1. In a combined rocket-ram-jet aircraft, a tubular casing having both an inlet and an outlet for ram air, a tubular mass of solid propellant concentrically disposed within said tubular casing for rocket motor operation, a liquid ram-jet fuel container concentrically disposed within said tubular mass for ram-jet motor operation, a combustion chamber comprising a tubular chamber concentrically disposed between said tubular casing and said solid propellant in a manner to permit radial burning of said solid propellant, a mechanical valve composed of non-consumable material and of generally annular configuration encircling said liquid fuel container and positioned between said combustion chamber and said ram-air inlet so as to prevent air flow through the combustion chamber when in closed position, said valve being maintained in closed position by contact with said solid propellant, said valve comprising a plurality of radially-hinged flaps designed to be substantially air-tight when in contact with said solid propellant and being opened by the pressure of ram air when said tubular mass has been consumed in a manner to permit ram air to pass to said combustion chamber whereby said ram-jet motor becomes operative to sustain flight of said aircraft.

3,724,217
ROCKET SYSTEM

Allan J. McDonald, Brigham City, Utah, assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed Oct. 6, 1971, Ser. No. 187,009
Int. Cl. F02k *9/04*
U.S. Cl. 60—254 7 Claims



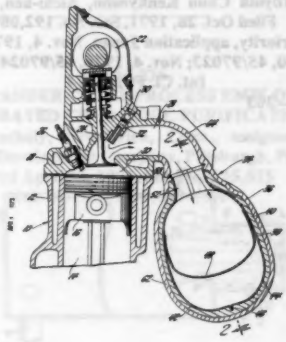
An extinguishable, solid propellant rocket motor has a forward propellant grain in abutting relationship with an aft propellant grain, with a common perforation extending through both. The aft grain, primarily for propulsion, is much more energetic than the forward grain, which is primarily for furnishing gases for control mechanisms. A gas generator in communication with the forward end of the rocket motor is valved therewith so that, in cooperation with the rocket motor, a variety of operations are possible with gases being contributed by either or both the rocket motor and the gas generator for propulsion and control mechanisms.

3,724,218
ENGINE EXHAUST REACTOR AND METHOD OF MAKING

Edward N. Cole, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 4, 1971, Ser. No. 140,035
Int. Cl. F01n *3/10, 7/18*
U.S. Cl. 60—282 8 Claims

An exhaust reactor for an internal combustion engine is preferably formed as a large volume manifold having a cast iron outer shell containing a baffled sheet metal inner liner with an intermediate insulating layer of core sand encapsulated between the walls of the inner liner and outer shell. The reactor is constructed by first fabricating the metal inner liner,



then applying the insulating layer of core sand to the outer surfaces of the liner exclusive of certain protruding portions, casting the iron outer shell around the sand core and sheet metal liner so as to completely encapsulate the sand layer between the inner layer and outer shell.

3,724,219
DEVICE FOR SECURING A SOLID PROPELLANT GRAIN IN A COMBUSTION CHAMBER

Pierre Allard, Antony; Jacques Laparre, Viroflay; Claude Lemaitre, Wissous, all of France

Filed May 21, 1971, Ser. No. 145,834
Claims priority, application France, May 28, 1970, 7019637
Int. Cl. F02k *9/04*
U.S. Cl. 60—255 5 Claims

A device for securing a propellant grain in the combustion chamber of a propellant unit comprises a plate fast with the front end of the propulsion unit. The front face of the propellant grain is fixed rigidly to the plate. The propellant grain is secured to the plate by means of stud members engaging into openings formed adjacent the periphery of the plate and permitting expansion of the grain without engendering significant stresses. A grid fast with the rear face of the grain and having a cylindrical bearing surface cooperates with a bore of the rear end of the propulsion unit.

3,724,220

EXHAUST GAS PURIFYING DEVICE FOR INTERNAL COMBUSTION ENGINES

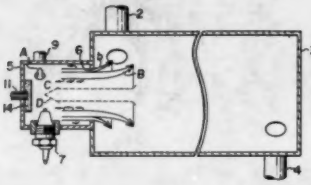
Yasusi Tanasawa, Nagoya; Tokuta Inoue, Sizuoka-ken; Kenji Ishiguro, Aichi-ken, and Tokio Kohama, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Aichi-ken; Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, all of Japan

Filed Oct. 26, 1971, Ser. No. 192,089

Claims priority, application Japan, Nov. 4, 1970, 45/97022; Nov. 4, 1970, 45/97023; Nov. 4, 1970, 45/97024

Int. Cl. F01n 3/14

U.S. Cl. 60—303 11 Claims



An exhaust gas purifying device for burning the unburnt component contained in the exhaust gas of an internal combustion engine. A swirl of air is formed in a combustion chamber, fuel is supplied into the combustion chamber and burnt, and a combustion flame swirling in the combustion chamber is blown into a reaction chamber disposed in an exhaust pipe of the internal combustion engine. A porous member made of noncombustible material is mounted to an opening of a fuel spouting pipe opened into the combustion chamber.

3,724,221

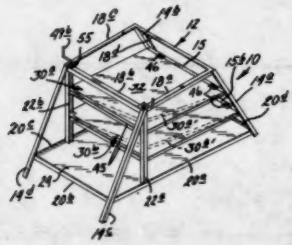
WATER CURRENT DIRECTING APPARATUS

Arthur R. Cool, Box 121, 111 Sunrise Drive, Livingston, Mont.

Filed Oct. 21, 1971, Ser. No. 191,414

Int. Cl. E02b 3/04

U.S. Cl. 61—3 8 Claims



A water current directing unit including an essentially open frame structure for supporting a plurality of flexible, vertically spaced current directing surfaces. Each of the current directing surfaces is inclined slightly upward from the horizontal toward the downstream end of the frame structure causing the water passing over the surfaces to force the unit toward the bottom of the stream, channel, etc. (i.e. to anchor the unit). The upstream edge of each of the current directing surfaces is pivotably attached to the frame structure and each of the corners along the downstream edges is independently moveable in the vertical direction so as to form a curved current diverting surface. A plurality of the current directing units can be positioned in either a series or parallel arrangement so as to effect the desired current diversion.

3,724,222

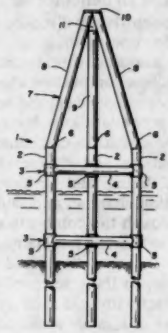
MOORING STRUCTURE AND METHOD

Graydon H. Crain, Freedom Road, RD No. 3, Mars, Pa.

Filed June 10, 1971, Ser. No. 151,641

Int. Cl. E02d 13/00; E02b 3/06

U.S. Cl. 61—46 5 Claims



This invention relates to a mooring structure and method of construction thereof, comprising a triangular template or diaphragm having vertical sleeves at the corners through which tubular legs or piles are driven in telescoping arrangement while the template is supported by beams whose ends are held on two barges straddling the structure. The sleeves are welded to the legs. A prefabricated triangular tripod is welded to the top of the legs. Concrete is then poured into the legs. One or more diaphragms may be used with each structure at a selected height above or below the water level.

3,724,223

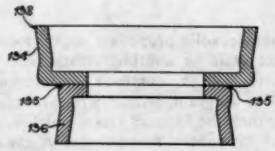
ONE PIECE, DRIVE FIT, CLOSURE CAP AND SLEEVE FOR PILES

Charles R. Pepe, Old Quarry Road, Apline, N.J.

Filed Nov. 27, 1970, Ser. No. 93,278

Int. Cl. E02d 5/00, 5/72; F16l 25/00

U.S. Cl. 61—53 28 Claims



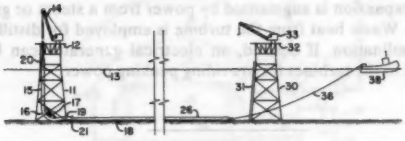
A drive fit, closure cap for pipe piles formed of a pan having tapered upright sides, the tapered sides serving to lead the pipe into the pan and thereby reduce the pipe diameter to a lesser diameter than it originally had, to thus make a nonwelding self locking water tight joint for efficient pile driving. The pan is provided with an internal annular ring which may be utilized to retain gasket and/or sealant material or may be sized to be a drive fit on the inside of the pipe while the tapered sides of the pan form a drive fit on the outside of the pipe.

A drive fit sleeve for joining two pipe piles formed of two such drive fit closure caps joined bottom to bottom and having their bases' centers blanked out.

3,724,224
METHOD FOR INSTALLING DOUBLE-WALLED PIPELINES

Jamie F. Matthews, Jr., Houston, Tex., assignor to Esso Production and Research Company

Filed June 7, 1971, Ser. No. 150,497
Int. Cl. F16l 1/00, 7/00
U.S. Cl. 61—72.3 **18 Claims**

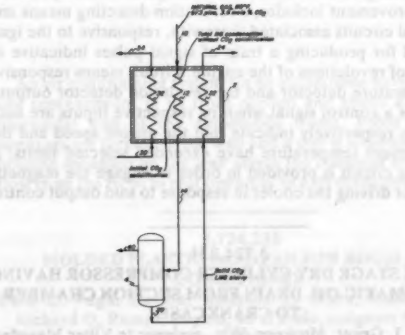


A double-walled pipeline is installed on the bottom of a body of water by installing a riser having a large bend near its lower end or a similar member at an offshore platform or other installation from which the pipeline is to extend, installing an outer pipe string along the pipeline route between the platform or other installation and the pipeline terminus, passing a cable through the riser or similar member and the outer pipe string, and then moving an inner pipe string into position within the riser or similar member and the outer pipe string.

3,724,225
SEPARATION OF CARBON DIOXIDE FROM A NATURAL GAS STREAM

Paul A. Mancini, New York, N.Y., and Walter G. May, Summit, N.J., assignors to Esso Research and Engineering Company

Filed Feb. 25, 1970, Ser. No. 13,931
Int. Cl. F25j 1/00, 1/02
U.S. Cl. 62—12 **1 Claim**

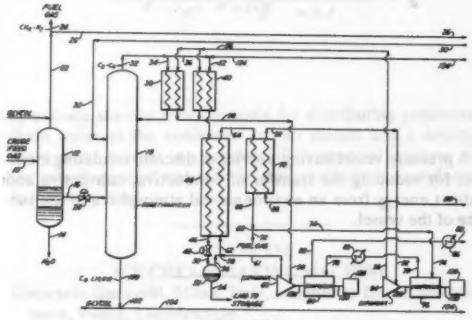


A process for the removal of carbon dioxide from a natural gas stream during the liquefaction of said gas stream. The gas stream containing carbon dioxide is cooled, resulting in the crystallization of carbon dioxide from the totally condensed liquid stream. A slurry comprising the crystallized carbon dioxide and a portion of the liquid is recycled, providing a fraction of the refrigeration required for cooling the gas stream.

3,724,226
LNG EXPANDER CYCLE PROCESS EMPLOYING INTEGRATED CRYOGENIC PURIFICATION

Robert W. Pachaly, Greenwich, Conn., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed April 20, 1971, Ser. No. 135,615
Int. Cl. F25j 1/00, 3/00, 3/02
U.S. Cl. 62—39 **17 Claims**



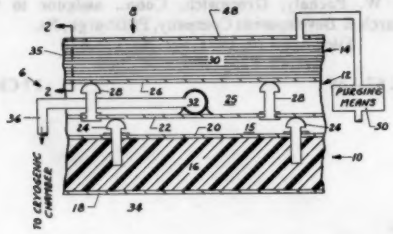
A process and apparatus for the liquefaction of natural gas wherein raw feedstock is cryogenically fractionated to remove essentially all of the carbon dioxide and C_{5+}hydrocarbons therefrom, and wherein the cryogenically purified feedstock is cooled and liquefied under pressure in a cryogenic heat exchanger. The pressurized cold liquid from the heat exchanger is isenthalpically expanded to reduce the pressure and further cool the liquid while at the same time flashing a minor gas fraction. Refrigeration for the liquefaction of the natural gas is supplied by a circulating refrigerant stream which is compressed and work-expanded to obtain the necessary cooling. The minor flash gas portion of the liquefaction step is commingled with the circulating refrigerant stream so that the analysis of the refrigerant stream is always rich in the lighter portions of the liquefaction stream, thus aiding in maintaining refrigeration temperature differentials to drive the liquefaction step. The work-expanded refrigerant portion undergoes a compression cycle and is work-expanded in a series of expansion turbines. The expansion turbines furnish at least part of the power necessary to drive the compressor system in the refrigerant gas cycle.

3,724,227
Patent Not Issued For This Number

3,724,228
COMPOSITE INSULATION FOR CRYOGENIC VESSEL

Blase J. Sollami; Howard R. Lundeen, and Bruce F. Gerth, all of Davenport, Iowa, assignors to The Bendix Corporation, South Bend, Ind.

Filed July 30, 1970, Ser. No. 62,220
Int. Cl. F17c 9/02
U.S. Cl. 62—50 1 Claim

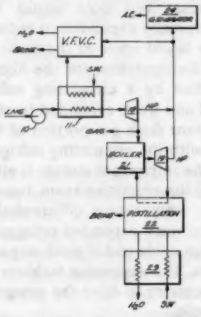


A pressure vessel having a series of discrete insulating members for reducing the transfer of conductive, convective and radiant energy from an environmental atmosphere to the surface of the vessel.

3,724,229
COMBINATION LIQUEFIED NATURAL GAS EXPANSION AND DESALINATION APPARATUS AND METHOD

Joseph Seliber, Wilmette, Ill., assignor to Pacific Lighting Service Co., Los Angeles, Calif.

Filed Feb. 25, 1971, Ser. No. 118,668
Int. Cl. F17c 7/02
U.S. Cl. 62—52 14 Claims

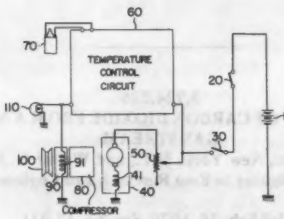


A method and combined apparatus for vaporizing liquefied natural gas and expanding the gas through a turbine for generating power is described. The energy for heating the liquefied natural gas for vaporization is obtained by transferring heat from sea water or other saline water. The water, so cooled, is then passed to a vacuum freezing, vapor compression system for obtaining fresh water and brine. In another embodiment, cooling of sea water is obtained from cold natural gas already expanded through a first turbine for producing shaft horsepower. Energy for vaporizing and expanding the liquefied natural gas is obtained by transferring heat from compressed air. The air so cooled is liquefied and fractionated to produce liquid nitrogen and either liquid or gaseous oxygen. In both embodiments shaft horsepower from the turbines is coupled to the compressor of the vacuum freezing, vapor compression apparatus. The power available from natural gas expansion is augmented by power from a steam or gas turbine. Waste heat from the turbine is employed for distillation desalination. If desired, an electrical generator can be coupled to the turbines for providing peaking power.

3,724,230
TEMPERATURE CONTROL SYSTEM FOR A CAR COOLER

Katsuya Muto, Kariya, and Yoshichi Kawashima, Gifu, both of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Nov. 10, 1970, Ser. No. 88,345
Claims priority, application Japan, Dec. 27, 1969, 44/41670
Int. Cl. B60h 3/04
U.S. Cl. 62—133 6 Claims



A control system for a vehicle compartment cooler has been provided wherein the cooler is driven by an internal combustion engine through a magnetic clutch having a detector for providing an indication of the compartment temperature. The improvement includes, a revolution detecting means and electrical circuits associated therewith, responsive to the ignition coil for producing a train of signal pulses indicative of number of revolutions of the engine. Circuit means responsive to temperature detector and the revolution detector outputs, produces a control signal when its respective inputs are such that they respectively indicate that the engine speed and the compartment temperature have exceeded selected limits. A switching circuit is provided in order to engage the magnetic clutch for driving the cooler in response to said output control signal.

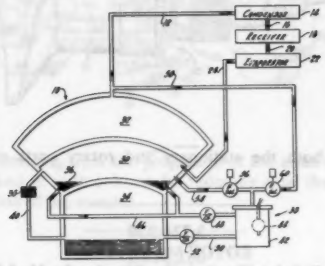
3,724,231
SINGLE STAGE DRY CYLINDER COMPRESSOR HAVING AUTOMATIC OIL DRAIN FROM SUCTION CHAMBER TO CRANKCASE

Whitney I. Grant, Muskego, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Oct. 8, 1971, Ser. No. 187,801
Int. Cl. F25b 31/00
U.S. Cl. 62—157 8 Claims

An automatic draining apparatus for draining the oil from a suction chamber to the crankcase of a single-stage refrigera-

tion compressor. The apparatus includes a collecting tank having a float switch, a first conduit connecting the suction chamber in oil-draining relation with the collecting tank; a second conduit connecting the collecting tank in oil-draining relation with the crankcase; a third conduit having a first solenoid interposed therein connecting the collecting tank in



equal pressure relation with the suction chamber; a fourth conduit having a second solenoid valve interposed therein connecting the collecting tank in equal pressure relation with the discharge chamber; and an electrical circuit operatively connecting the first and second solenoid valves to the float switch to automatically control the solenoid valves in response to the level of oil in the collecting tank.

3,724,232

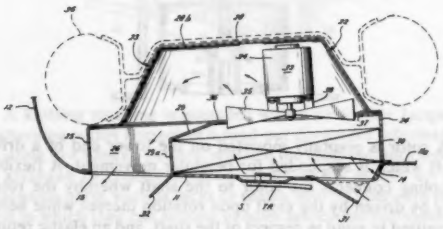
AUTOMOBILE AIR CONDITIONING SYSTEM

Don P. Dixon, and John T. Bertva, both of P.O. Box 8648, San Antonio, Tex.

Filed July 6, 1971, Ser. No. 159,881

Int. Cl. B60h *3/04*

U.S. Cl. 62—244 **16 Claims**



An air conditioning system for an automobile having a spare tire compartment in its front portion and above a generally horizontal wall of the automobile frame. Front and rear openings are formed in the wall and a coil is arranged within a housing mounted on the wall above the openings to cause air flow from the front to rear openings to pass through it.

3,724,233

MOLDED PLASTIC BASE PAN FOR ROOM AIR CONDITIONER

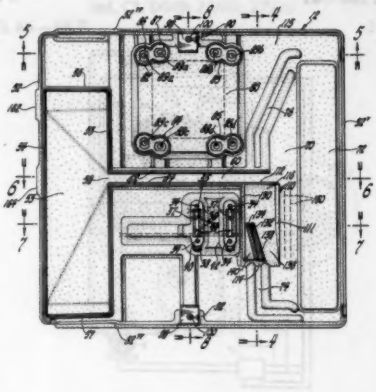
Cecil C. Pugh, Dayton; Emerson L. Wark, Vandalia, and Richard O. Rumpf, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 17, 1972, Ser. No. 227,487

Int. Cl. F25d *21/14*

U.S. Cl. 62—285 **7 Claims**

A molded one-piece plastic base pan for an air conditioner having a raised segmental trough configured to accommodate a notched opening in the air outlet ring portion of a condenser fan shroud. The trough segment has a concave upper surface closing the air outlet ring and is located partially in the depressed sump region of the base pan and includes a plurality



of arcuate skewed flow channels for distributing condensate drain water to the condenser fan air stream and a diverting ramp which merges in a substantially tangential juncture with the trough segment upper surface for recirculating condensate to the sump area.

3,724,234

ICE CREAM MAKING MACHINE

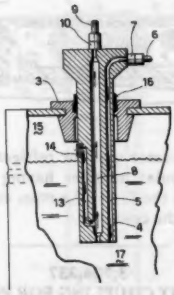
Giancarlo Garavelli, Milan, Italy, assignor to Heron Establishment, Vaduz, Liechtenstein

Filed June 24, 1970, Ser. No. 49,450

Claims priority, application Switzerland, July 2, 1969, 10114/69

Int. Cl. F25c *7/14*

U.S. Cl. 62—308 **7 Claims**



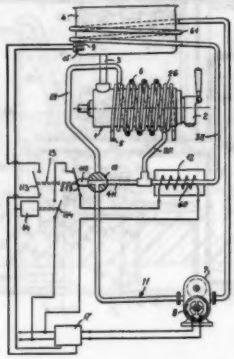
An ice cream making machine using disposable air tight containers for the mix, the container being placed under pressure by compressed gas, which thus causes the liquid to mix with the gas, the combination taking place at a molecular level, and which also causes the emulsion thus formed to be conveyed to the ice cream distributor.

3,724,235

SOFT ICE PRODUCT MACHINE WITH HEATING AND COOLING

Poerio Carpigiani, Via Cairoli 14, Bologna, Italy

Division of Ser. No. 8,529, Feb. 4, 1970, abandoned. This application March 11, 1971, Ser. No. 123,393
Claims priority, application Italy, Feb. 8, 1969, 6787 A/69
Int. Cl. F25c *7/10*
U.S. Cl. 165—61 **3 Claims**



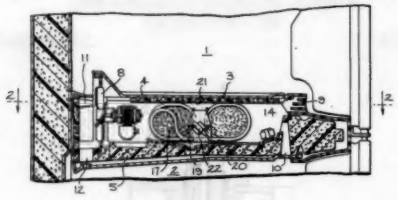
The invention relates to a machine and method for making a soft ice cream product formed of frozen air and gelatin dispersion. Heating means are provided to melt the gelatin solution in the liquid mix tank before mixing same with air and feeling same into the freezing cylinder.

3,724,236

REFRIGERATOR EVAPORATOR

Robert B. Gelbard, Louisville, Ky., assignor to General Electric Company

Filed Nov. 1, 1971, Ser. No. 194,341
Int. Cl. F25d *17/06*
U.S. Cl. 62—419 **5 Claims**



A compact evaporator unit for refrigerators comprising a helically coiled tubular member having an extended heat exchange surface in the form of a mass of metal wool within and in contact with the coils.

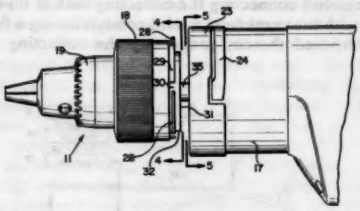
3,724,237

ATTACHMENT COUPLING FOR POWER TOOL

John W. Wood, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed June 7, 1971, Ser. No. 150,344
Int. Cl. F16c *1/06, 1/12*
U.S. Cl. 64—4 **17 Claims**

An improved attachment coupling means for use in attaching a variety of tool heads to a common power unit is provided in which a spring biasing means is utilized to draw the head and the power unit together when the coupling is made. In addition, flat surfaces are provided at the abutment point so that the spring biasing maintains the head in proper alignment with the drive unit. Axial and radial piloting surfaces are provided for both the stationary and rotary parts of the attachment.

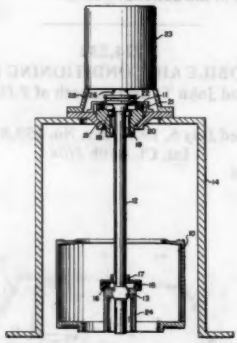


3,724,238

ROTOR MOUNTING

Roger Retali, Saint Cloud; Andre Mercier, La Madelene, both of France, and Claude Billot, Alger, Algeria, assignors to Fives Lille-Cail, Paris, France

Filed March 16, 1971, Ser. No. 124,798
Claims priority, application France, March 17, 1970, 7009383
Int. Cl. F16d *3/02*
U.S. Cl. 64—7 **12 Claims**



A rotor is pivotally mounted on the lower end of a drive shaft which is suspended for pendular movement. A flexible coupling connects the rotor to the shaft whereby the rotor may be driven by the shaft upon rotation thereof while being permitted to pivot in respect of the shaft, and an elastic return means interposed between the rotor and the shaft tends to move the rotor opposite to the pivoting movement thereof.

3,724,239

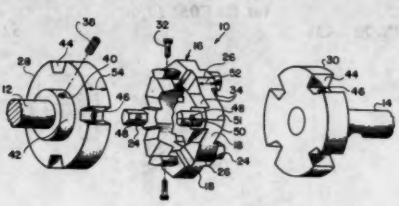
RESILIENT COUPLING

Michael M. Callstrat, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Feb. 8, 1972, Ser. No. 224,505
Int. Cl. F16d *3/78*
U.S. Cl. 64—13 **30 Claims**

A coupling for two generally coaxially aligned shafts which comprises an annulus having a series of rectilinear, resilient, and compressible columns connected with their longitudinal axes along the sides of a flat polygon. Arms project transversely from the longitudinal axes at each intersection of two adjacent columns; the arms alternately project from the front and rear faces of each of the adjacent columns with respect to the plane of the flat polygon. Hubs are secured on each of the shafts for receiving the alternate arms on the annulus respectively; fasteners operate radially through each arm for secur-

ing the arms to the hubs and decreasing the radius of the annulus thereby placing the columns under a precompressive load. A recess is formed on each of the front and rear faces of each



column extending from the projection of the arms toward the opposite end of each column for reducing axial thrust during compression of the annulus.

3,724,240

KNITTING MACHINE WITH DEVICE FOR JACQUARD PATTERNING

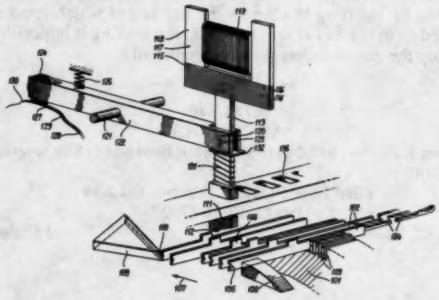
Karl Flad, 29 Haupstrasse, Undingen, Germany

Filed Nov. 12, 1970, Ser. No. 88,545

Claims priority, application Germany, Nov. 14, 1969, P 19 57 399.0

Int. Cl. D04b *15/78*

U.S. Cl. 66—50 R **10 Claims**



A knitting machine is provided with a device for Jacquard patterning which comprises a read-out device for information relating to a desired pattern, wherein the read-out information is arranged to control electromagnets which in turn set displaceable parts, such as jacks or plates, into an operative position in which they can actuate needles associated therewith, or into a rest position, in which they can miss the needles. For this purpose each electromagnet is arranged to control the position of a guide face, and each guide face is arranged to control a group of parts during relative movement between the guide faces and the groups. The parts of a group are separated from each other by the parts of other groups, and are of a number which is smaller by one than the number of electromagnets. The guide faces are staggered is a row transverse to the direction of relative movement and co-operate with control faces which are disposed on the parts at correspondingly staggered locations. The invention is adaptable for use in flat bed knitting machines and circular knitting machines. A mechanical cam disc controls a pivot arm which has an end opposite the control disc in engagement with a member directly controlling a slide member so that such slide member may be moved in one position by said electro-magnetic means only when said cam is in a certain predetermined range of rotation. The slider member has a lower end comprising the guide face for directly engaging the control faces which are provided on the jacks or plates, which jacks or plates in turn directly engage the knitting needles.

3,724,241

WARP KNITTING MACHINE

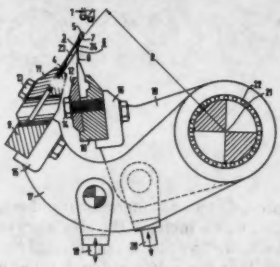
Arno Zwingenberger, Marxgrun, and Adolf Hagel, Bobengrum, Bavaria, both of Germany, assignors to Karl Liebrandt, Bavaria, Germany

Continuation of Ser. No. 809,537, March 24, 1969, abandoned. This application June 3, 1971, Ser. No. 149,824

Claims priority, application Germany, April 9, 1968, P17 60 140.0

Int. Cl. D04b *23/00, 27/00*

U.S. Cl. 66—86 R **2 Claims**



The speed and smoothness of warp knitting machines are improved by proportioning the upper beveled straight part of the slide to attain its position for picking up and casting off the loop while its bend remains in the shank trough without interfering in its lower position with the loop on the shank of the needle. The beveled part of the slide and the working portion of the hooked needle do not come into contact in the bottom of the shank trough.

3,724,242

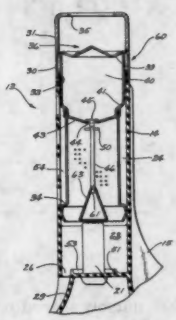
WASHING ADDITIVE DISPENSER

Gordon Jerry Davis, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Oct. 30, 1970, Ser. No. 85,569

Int. Cl. D06f *39/02*

U.S. Cl. 68—17 A **7 Claims**

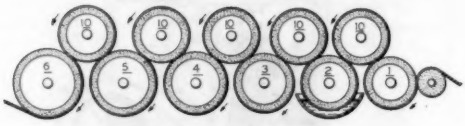


A dispenser is mounted on the agitator of an automatic washer and is responsive to a condition of the washing fluid, such as a predetermined liquid level or agitator-induced liquid movement, for releasing the washing additive into the washing liquid through the hollow centerpost of the agitator.

3,724,243
CHAINLESS MERCERIZER SUITABLE FOR USE WITH LIQUID AMMONIA

Timothy A. Calamari, Jr.; Sidney P. Schreiber; Albert S. Cooper, Jr., and Wilson A. Reeves, all of Metairie, La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed May 7, 1971, Ser. No. 141,353
Int. Cl. B05c 3/132; D06f 45/22; D06c 15/08
U.S. Cl. 68—244 1 Claim

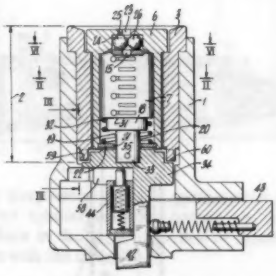


An improved chainless mercerizer utilizing a series of graduated rollers which increase the efficiency of a chainless mercerizer. Each driven roller is constructed incrementally larger in diameter than the previous driven roller in the direction of fabric travel through the mercerizer. The fabric being mercerized is stretched incrementally tighter as it is transferred from one driven roller to the next succeeding one, thereby increasing the forces opposing widthwise shrinkage. The idler rollers have a uniform diameter approximately that of any of the driven rollers.

3,724,244
LOCK ACTUATED ANTI-THEFT DEVICE MAINLY FOR AUTOMOBILES

Gunter Schaumburg, Radevormwald, Germany, assignor to Societe D'Exploitation Des Brevets Neiman S.A., Neuilly, France

Filed Nov. 12, 1971, Ser. No. 198,184
Claims priority, application Germany, Nov. 30, 1970, P 20 58 802.7
Int. Cl. E05b 17/14, 27/10; F05b 65/12
U.S. Cl. 70—360 11 Claims

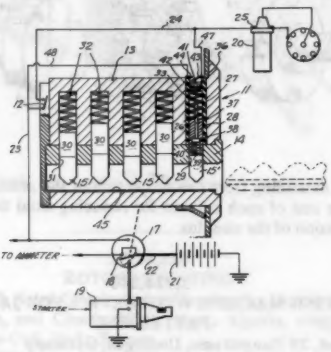


Cylinders or other suitably shaped rollers are provided in the direct vicinity of the key hole portion of the lock, for shifting axially and transversely of the lock along suitable wall portions of the lock. Operation of the key causes internal shifting of the rollers and then moves other lock portions into positions wherein the locking latch first becomes ready to lock and then actually locks. The locking position is fully established by total removal of the key from the lock. This leaves the rollers in a certain position, wherein they in turn hold the lock in shake-proof, locked condition, until the key is reinserted.

3,724,245
IGNITION LOCK

Ruben P. Kitchen, Jr., Route 3, Box 511, Ashland, Ky.

Filed July 23, 1971, Ser. No. 165,641
Int. Cl. E05b 15/00
U.S. Cl. 70—431 6 Claims

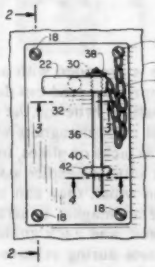


A starting switch for a motor vehicle. The switch has a rotary key-operated barrel for energizing the conventional starting motor solenoid switch and has an ignition switch element which is closed by the movement of one of the tumblers caused by inserting the key in the barrel and which remains closed until the key is removed, thereby making it impossible to stop the engine unless the key is removed.

3,724,246
SAFETY LOCK

James Katsaros, 642 North Plymouth Boulevard, Los Angeles, Calif.

Filed June 10, 1970, Ser. No. 151,804
Int. Cl. E05b 17/00
U.S. Cl. 70—431 3 Claims



Herein described is a safety locking device including an aperture extending through a portion of the locking knob which is displaced offset from the rotational center thereof, and which is aligned substantially on a vertical axis. An elongated pin is provided to be inserted in the aperture in the knob and engage a means permanently affixed on the door or door plate to secure at least one end of the pin to prevent arcuate or rotational movement thereof. A second embodiment illustrates a substantially U-shaped member adapted to fit over the inside of an oblong or elongated shaped knob which includes a substantially elongated shaft mounted to the U-shaped member and extends downwardly from the lock to engage the door knob to prevent rotational movement of the knob when the door is locked.

3,724,247

PRODUCTION OF DEEP DRAWN PRESSINGS

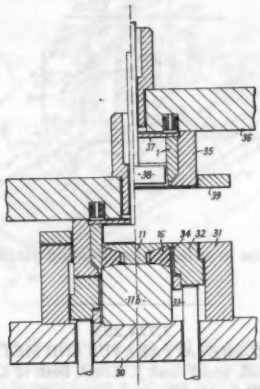
Clifford Frank Page, Banbury, England, assignor to Alcan Research and Development, Montreal, Quebec, Canada

Filed May 27, 1971, Ser. No. 147,380

Claims priority, application Great Britain, June 2, 1970, 26,662/70

Int. Cl. B21d *28/18*

U.S. Cl. 72—60 **6 Claims**



Wrinkle free deep drawn shells are formed from aluminium foil and other similar materials by employing a tapered die and a punch having a radially compressible elastic or hydropneumatic element at the nose end of the punch, such element having initial dimensions approximately equal to those of the die mouth.

3,724,248

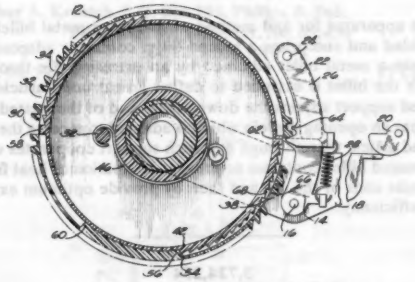
TIMER

George Obermann, Niles, Ill., assignor to Controls Company of America, Melrose Park, Ill.

Filed Oct. 7, 1971, Ser. No. 187,416

Int. Cl. F16h *29/00*

U.S. Cl. 74—122 **3 Claims**



The outer ratchet wheel is a part of the timing cam drum of a step-by-step type of interval timer. The outer ratchet is advanced by means of a pawl which is reciprocated as the slow rise fast drop cam rotates to retract the pawl one tooth and advance the pawl with a snap action until the pawl abuts a stop member, at which time the retaining pawl engages the same tooth to hold the cam in place. At certain intervals or positions on the outer ratchet the teeth are missing thereby allowing the drive pawl (and then the retaining pawl) to "reach inside" and engage a time delay ratchet which is then advanced inside the outer ratchet a number of steps until the inner ratchet engages the inside of the outer ratchet and starts driving the outer ratchet until the drive pawl and retaining pawl are back onto the outside ratchet, at which time the inside ratchet is released and returned to its original point by the spring bias. This allows what would normally be a short interval on the outer ratchet to be "stretched" to provide a long interval without consuming too many steps of the timing cam.

3,724,249

METHOD OF AND DEVICE FOR THE COILING OF METAL TAPE OR STRIP

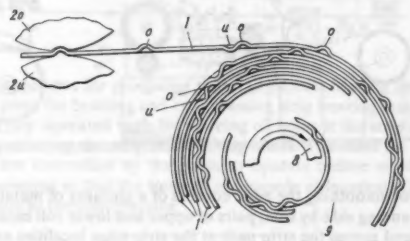
Werner Asbeck, 4 Dusseldorf-Rath, and Hermann Wilkening, Dusseldorf-Kaiserswerth, both of Germany, assignors to Klockner-Werke Aktiengesellschaft, Duisburg, Germany

Filed March 2, 1971, Ser. No. 120,100

Claims priority, application Germany, March 28, 1970, P 20 15 100.2; Nov. 6, 1970, P 20 54 595.3

Int. Cl. B21d *19/00*

U.S. Cl. 72—146 **20 Claims**



A method of coiling metal tape with spaced convolutions, whereby both rims of the tape are deformed, characterized in that the tape is wound on a horizontal axis and is provided at its edges with deformations arranged so that deformations in adjacent convolutions interlock to prevent relative tangential and/or axial movement between said convolutions, and a device for carrying out the method and for manufacturing tape edge deformations acting in a manner to interlock adjacent convolutions in a coil of tape wound on a horizontal axis whereby tool equipped tool holders rotatable into a working position are provided on the periphery of a pair of disc-bodies arranged respectively on opposite sides of the tape edge.

3,724,250

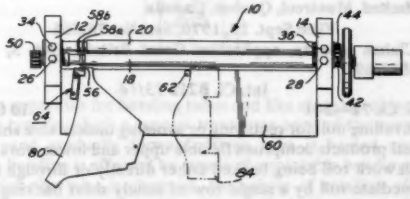
ROLLING AND BEADING MACHINE

Angelo R. Molino, Landmark Apartments, Cherry Hill, N.J.

Filed Oct. 4, 1971, Ser. No. 186,295

Int. Cl. B21d *5/14*

U.S. Cl. 72—171 **3 Claims**



Forming apparatus for forming a sheet of metal preform into a tubular duct. The forming apparatus includes three parallel rollers adapted to bend the preform into a tubular shape as the preform passes between the rollers. The rollers also include mating forming ribs adjacent one end thereof for

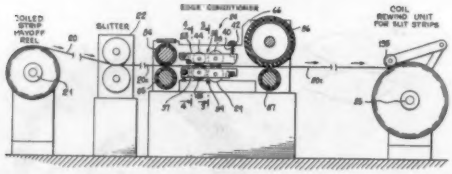
forming a bead on the end of the tubular member simultaneously with the bending of the preform into the tubular shape. A table is provided in front of the rollers to facilitate feeding the preform between the rollers. On the table are separate guide means for guiding the preform between the rollers. One guide means is adjacent the forming ribs to be used to form a tubular member with a bead on one end. The other guide means is located intermediate the ends of the rollers to be used to form a tubular member without a bead.

3,724,251

EDGE CONDITIONING OF METAL STRIPS

Herman E. Wegner, Riverside, Calif., assignor to Alcan Research and Development Limited, Montreal, Quebec, Canada

Filed April 27, 1971, Ser. No. 137,821
Int. Cl. B21b *1/00*
U.S. Cl. 72—203 **26 Claims**



For smoothing the edge corners of a plurality of metal strips advancing side by side, pairs of upper and lower roll means are spaced across the strip path at the strip edge localities and are provided with slightly tapered roll surfaces, each pair of roll means having individually yieldable support pressing its upper and lower rolls toward each other for rolling engagement of their surfaces with the strip edge corners whereby sharp corners and other burrs are rolled below the sheet surface planes. Coacting fin and groove rolls are advantageously disposed to guide the strips at and between the strip edges, as advancing to the corner engaging rolls. Effective roll cages comprise pairs of complementary upper and lower modules, each module extending along the strip path and carrying one of the guide rolls and one of the corner engaging rolls, to coact with like rolls of the complementary module. The several modules, with one of each pair spring-loaded, are removably mounted on supporting structure and are thereon adjustable in position crosswise of the strip path, whereby various numbers and widths of strips can be subjected to edge conditioning.

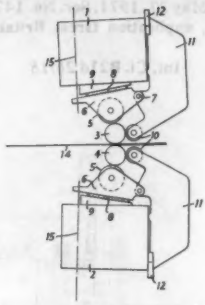
3,724,252

FLATTENING MILL

William Albert Baker, Walton-on-Thames, Surrey; Anthony Sydney Charles Barker, Deddington, Oxfordshire; John James Edmund Holden, Chester, Cheshire, and Stanley Pilkington Winterburn, Banbury, Oxfordshire, all of England, assignors to Alcan Research and Development Limited, Montreal, Quebec, Canada

Filed Sept. 29, 1970, Ser. No. 76,566
Claims priority, application Great Britain, Oct. 3, 1969, 48,833/69
Int. Cl. B21b *13/14*
U.S. Cl. 72—241 **10 Claims**

A rolling mill for rectifying or avoiding undesirable shape in rolled products comprises flexible upper and lower work rolls, each work roll being backed either directly or through an intermediate roll by a single row of axially short backing rolls, each of which is carried in a carrier pivoted to a rigid member of the mill frame, the pivots of all the carriers associated with each work roll being aligned with one another, said mill including means for applying a substantially constant loading force to each of said carriers, the work rolls also being contacted by reaction rolls which contact the work rolls in such a manner that the reaction is substantially parallel with the plane of the strip pass between the work rolls to absorb the



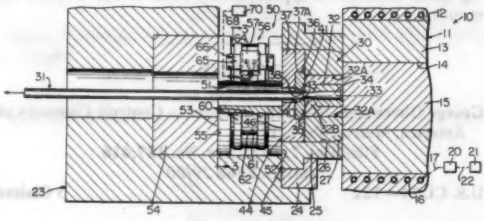
loads which arise in at least one direction parallel to the strip during rolling.

3,724,253

EXTRUSION APPARATUS AND METHOD

Donald H. Revell, and Frank J. Kittel, both of Louisville, Ky., assignors to Reynolds Metals Company, Richmond, Va.

Filed Feb. 19, 1971, Ser. No. 116,953
Int. Cl. B21c *29/04*
U.S. Cl. 72—253 **15 Claims**



An apparatus for and method of extruding metal billets is provided and comprises a heated billet container adapted to contain a metal billet adjoined by an extrusion die through which the billet is extruded to define an extruded article. A heated support adjoins the downstream end of the heated die and has an opening therein which is adapted to receive the extruded article therethrough and such support cooperates with the heated billet container to prevent dissipation of heat from opposite ends of the die and thereby provide optimum extrusion efficiency.

3,724,254

EXTRUSION OF SEAMLESS TUBING

Rene Hubert, Boulogne sur Seine, France, assignor to Ceflac, Paris, France

Filed Oct. 16, 1970, Ser. No. 81,570
Claims priority, application France, Nov. 5, 1969, 6937995
Int. Cl. B21c *23/04*; B21b *17/02*
U.S. Cl. 72—264 **5 Claims**

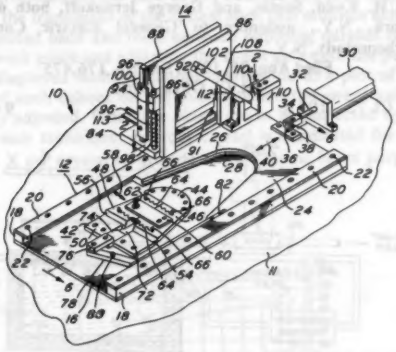
Improvement in the process of hot extruding metal tubes in a hydraulic press, in which the metal billet inserted into the press has been pierced to a bore diameter largly exceeding that of the extrusion mandrel and the force of the press is applied in a progressive manner.

3,724,255

DUCT FORMING APPARATUS

Angelo R. Molino, 816 East Building, Haddonview Apartments, Haddonfield, N.J.

Filed April 29, 1971, Ser. No. 138,444
Int. Cl. B21d *11/04*
U.S. Cl. 72—306 13 Claims



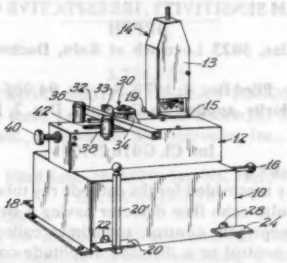
An apparatus for forming the end of a duct member includes a lip forming section and a flange forming section. The lip forming section includes a die bar and a vertical die plate movable vertically toward and away from the die bar. The die bar and die plate have mating die surfaces which when brought together with a portion of the edge of the duct therebetween will form the portion of the duct into a lip. The flange forming section includes a male die member and a female die member lying in a horizontal plane. The female die member is movable horizontally toward and away from the male die member. The male and female die members have mating edges which when brought together with the end of the duct therebetween will form a grooved flange around the edge of the duct. An air cylinder is connected to the female die member to move it toward and away from the male die member. The means for moving the die plate of the lip forming section is connected to the female die member so that the movement of the female die member also moves the die plate.

3,724,256

TUBE BENDER AND CUTTER

Arthur A. Kroetch, P.O. Box 256, Philips, S. Dak.

Filed Aug. 20, 1970, Ser. No. 65,434
Int. Cl. B21d *9/10*
U.S. Cl. 72—332 17 Claims



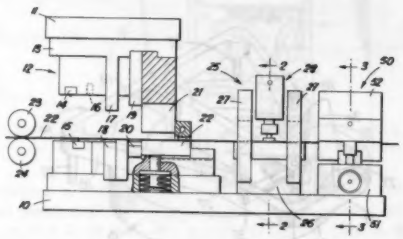
A cutting and bending machine for square or rectangular tubing in which a cutting hydraulic shear is pivotally mounted so as to swing down from the cutting position and help form a working surface upon which the bending operation can be completed. The bending portion comprises an adjustable mandrel adapted to engage a variety of sizes of tube and slidably force the tube between two parallel bending posts.

3,724,257

APPARATUS FOR MANUFACTURING THIN WALL FLEXIBLE BEARING LINERS

Arthur Albert Sims, South Harrow, and Stanley Gordon Sharp, Maidenhead, both of England, assignors to Vandervell Products Limited, Maidenhead, England

Filed Sept. 17, 1971, Ser. No. 181,548
Int. Cl. B21d *43/28*
U.S. Cl. 72—324 21 Claims



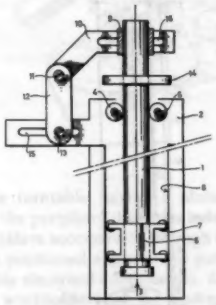
An apparatus for producing thin wall flexible bearing liners has a press for bending and coin pressing strip bearing material and ram operated tools for piercing oil holes in the strip and finally severing the strip into bearing liners. The rams for the tools are controlled by the press to operate before or after coin pressing so that the tools do not impede elongation of the strip due to the coin pressing.

3,724,258

APPARATUS FOR BENDING ELONGATE OBJECTS

Marinus Johannes Hofstede, and Hendrik Logman, both of Rijswijk, Netherlands, assignors to Cojafex N.V., Rotterdam, Netherlands

Filed March 5, 1971, Ser. No. 121,513
Claims priority, application Netherlands, Jan. 8, 1971, 7100269; April 12, 1970, 7003580
Int. Cl. B21d *7/024, 7/16*
U.S. Cl. 72—342 17 Claims



The apparatus for bending tubes and like elongate objects is of the type in which a narrow transverse zone of the progressively and gradually forward driven tube is heated and in which bending is effected by means of a rotatable bending arm to which the tube is clamped, the center of rotation of the bending arm being situated substantially in the plane of the heated zone of the tube. In order to alleviate some of the forces acting on the tube and on the apparatus the latter is constructed so as to allow a limited movement of the center of rotation of the bending arm and of the heated zone of the tube in relation to each other. Deviations in the bend radius are corrected by displacing the means for heating the tube.

3,724,259

METHOD OF TESTING THE LUBRICATION PROPERTIES OF A LIQUID

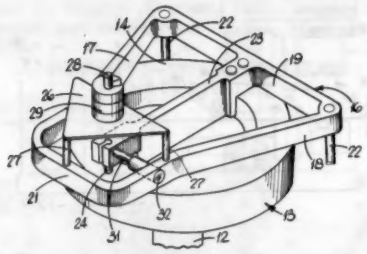
Ronald Edward Blakeley, Solihull, and Robert Turner, Hampton Magna, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 10, 1970, Ser. No. 53,914

Claims priority, application Great Britain, July 15, 1969, 35,485/69

Int. Cl. G01n *3/56, 33/30*

U.S. Cl. 73—10 **7 Claims**



In a method of testing the lubrication properties of a liquid the liquid is poured onto a plate and the plate is rotated so that the thickness of the film of liquid decreases until eventually a point is reached at which interference fringes are seen. When the last interference fringe is seen passing a predetermined point a probe is placed in contact with the plate and the length of time taken for the frictional heat developed between the probe and the plate to destroy the film is measured.

3,724,260

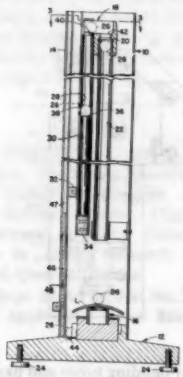
LENS FRANGIBILITY TESTING APPARATUS

Hamilton B. Bole, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed April 19, 1972, Ser. No. 245,441

Int. Cl. G01n *3/62*

U.S. Cl. 73—12 **5 Claims**



Drop ball apparatus for testing the frangibility of a lens including a base having an elongated hollow tower extending vertically therefrom with lens supporting means in the tower adjacent the base and a receptacle for receiving and guiding a steel ball to a drop point adjacent the uppermost end of the tower. A guideway along one side of the tower contains a lift rod normally having its uppermost end disposed intermediately of the height of the tower when the rod is located at a lowermost position in the guideway. A test ball placed upon the uppermost end of the lift rod through an aperture in the tower is elevated to the ball receptacle by raising of the rod. An opening at the bottom of the tower provides access to the lens holder and a sliding door normally closes this opening.

3,724,261

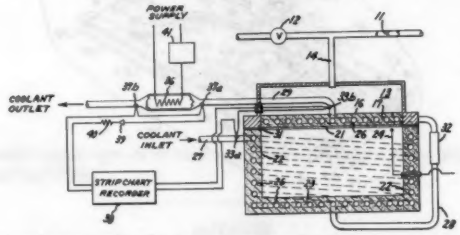
DEVICE FOR MEASURING HEAT RELEASE IN CONTINUOUS CALORIMETER

Paul H. Kydd, Scotia, and George Jernakoff, both of New York, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 31, 1971, Ser. No. 176,475

Int. Cl. G01k *17/00*

U.S. Cl. 73—190 R **9 Claims**



Voltages reflecting the heat released in a continuous calorimeter and absorbed by the coolant flow therethrough are sensed and converted to a convenient parameter by means of the device described herein. The device comprises in combination an electric heater disposed to heat the coolant flow downstream of the calorimeter; means for controlling power input to the electric heater; a first and second pair of means for generating an electromotive force (EMF) as a function of temperature differential (e.g. thermocouples); means (e.g., a strip chart recorder) electrically connected to said first and second pair of generating means for comparing the voltage outputs thereof and continuously displaying the relation therebetween (or some parameter related thereto); the EMF-generating means being disposed in contact with the coolant flow and being electrically connected to the comparing and display means; the two EMF-generating means of the first pair being disposed at the inlet and outlet, respectively, of the coolant flow to and from the calorimeter and the two EMF-generating means of the second pair being located downstream of the first pair with one upstream and one downstream of the electric heater.

3,724,262

METHOD FOR ADJUSTING SWEPT GAIN ON ULTRASONIC PULSE-ECHO INSTRUMENTS FOR UNIFORM SENSITIVITY, IRRESPECTIVE OF FLAW DEPTH

Ludwig Niklas, 5023 Lovenich at Koln, Dachsweg 13, Germany

Filed Dec. 1, 1970, Ser. No. 94,005

Claims priority, application Germany, Dec. 2, 1969, P 19 60 458.1

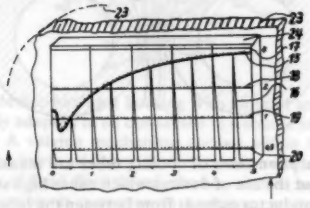
Int. Cl. G01n *29/04*

U.S. Cl. 73—67.8 **13 Claims**

An overlay is provided for the cathode ray tube screen of an ultrasonic pulse echo flaw detector having a swept gain control. The swept gain control, sometimes called a time-corrected gain control or a distance amplitude-correction gain control, provides for increasing the gain of the receiver system the later flaw echoes are received. By adjusting this gain properly, echoes from flaws of the same size will produce spikes of identical amplitude on the cathode ray tube screen irrespective of flaw depth. The overlay of the invention bears a plot of amplitude versus distance of echoes received from a known echo-producing interface common to a plurality of

parts to be tested when the swept gain control is properly adjusted. The common echo-producing interfaces disclosed and preferably used are an interface perpendicular to the path of the ultrasonic waves in the part having a cross sectional area much greater than the cross sectional area of the ultrasonic beam in the part, a large right angle corner, and a cylindrical test hole of known diameter.

One method of the invention comprises placing the overlay of the invention on the face of the cathode ray tube display, placing the transducer of the system such that multiple echoes are reflected back and forth between opposing parallel faces of the work piece and adjusting the swept gain until the peaks of the displayed multiple echoes correspond to a plot of the peaks of such echoes on the overlay when the swept gain is properly adjusted. When the plates are to be inspected by an angle beam technique, a Y cut crystal is substituted for the normal X cut crystal to provide the ultrasonic beam perpendicular to the opposed surfaces of the plate. In a second technique disclosed, the angle beam transducer is placed at integral multiples of the half skip distance from the edge of a rectangular work piece whereby the ultrasonic echoes are reflected from the right angle corners thereof and the swept gain is adjusted until the peaks of the spikes of these echoes coincide with a plot on the overlay of the peaks of such echoes at multiples of the half skip distance when the swept gain is properly adjusted. A third method according to the invention comprises placing the angle beam transducer at integral multiples of the half skip distance from a cylindrical hole in the work piece of known diameter and again the swept gain is adjusted until the peaks of the echo pulses received at these half skip intervals correspond to a predetermined curve on the overlay, which indicates the height of the echo spikes as seen on the cathode ray tube when the swept gain is properly adjusted.



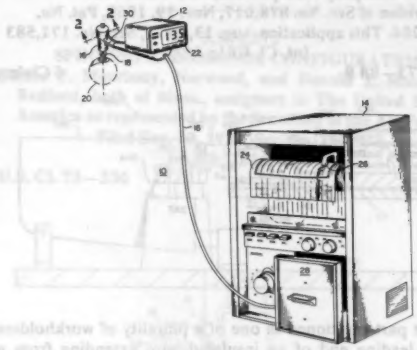
3,724,263

ELECTRICAL DIGITAL DISPLAY TONOMETER

Harold Bern Rose, Los Angeles, and Bruce Jay Sand, Encino, both of Calif., assignors to Bio-Optronics, Inc., Los Angeles, Calif.

Filed Sept. 29, 1970, Ser. No. 76,554
Int. Cl. A61b *3/16*
U.S. Cl. 73—80 **8 Claims**

Apparatus for measuring displacement is disclosed which includes a prehensible member including a transducer for developing an analog electrical signal whose value is a function of the displacement to be measured and digital display means for visually displaying a digital reading of such value. A stationary unit remote from the prehensible member is also provided which includes conversion means for converting the analog signal into a suitable digital signal for display in the digital display means. A flexible cord is provided interconnecting the prehensible member and the stationary unit for conducting the analog signals from the transducer to the conversion means and the digital signal from the conversion means to the digital display means.

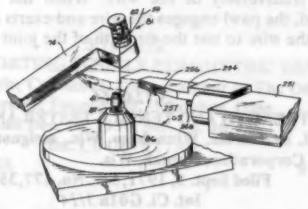


3,724,264

METHODS OF TESTING THE STRENGTH OF WIRE BONDS IN ELECTRICAL COMPONENTS

Thomas Alvin LaValle, Annapolis, Md., assignor to Western Electric Company Incorporated, New York, N.Y.

Division of Ser. No. 878,017, Nov. 19, 1969, Pat. No. 3,618,204. This application Aug. 13, 1971, Ser. No. 171,543
Int. Cl. G01b *5/30*
U.S. Cl. 73—88 B **2 Claims**



A rotatable turntable having a plurality of workholders spaced about the periphery thereof is indexed to advance each of the workholders successively through each of a plurality of work stations positioned adjacent the periphery of the turntable to assemble electrical components. A first part positioned in one of the workholders has the leading end of an insulated wire welded thereto. The first part is rotated in the workholder while tensioning the wire extending from and secured to the first part to wind the wire thereon as the workholder is advanced with the turntable through a work station where a second part is assembled to the first part and, simultaneously, the insulation on a portion of the wire extending from the first part is stripped. The trailing portion of the wire is welded to a metal cap which is secured to the second part. As the weld is made, a test device mounted pivotally on a welding electrode is caused to be moved transversely of the path of the electrode. Then, when the electrode is retracted, the test device engages the wire imparting a force thereto and testing the strength of the weld.

3,724,265

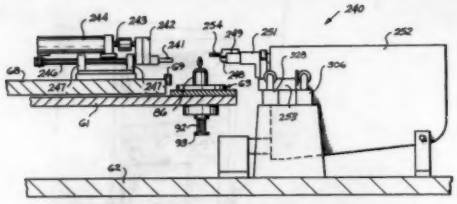
APPARATUS FOR TESTING THE STRENGTH OF THE JOINT OF A WIRE JOINED TO A PART

Thomas Alvin LaValle, Annapolis, Md., assignor to Western Electric Company Incorporated, New York, N.Y.

Division of Ser. No. 878,017, Nov. 19, 1969, Pat. No. 3,618,204. This application Aug. 13, 1971, Ser. No. 171,583

Int. Cl. G01n *3/00*

U.S. Cl. 73—88 B **4 Claims**



A first part positioned in one of a plurality of workholders has the leading end of an insulated wire extending from a supply of wire welded thereto at a second work station, after which the first part is indexed. A portion of the wire extending to the first part in the workholder is severed from the supply and the new leading end of the wire is attached to the first part in the next succeeding workholder. The first part is rotated in the first workholder while tensioning the wire extending therefrom to wind the wire thereon as the workholder is advanced. A second part is assembled to the first part and, simultaneously, the insulation on a portion of the wire extending from the first part is stripped.

The trailing bared portion of the wire is welded to the second part and the strength of the weld is tested. A welding apparatus has a test device which includes a pivotally mounted pawl that is transversely and longitudinally movable for engaging the length of wire extending from the welded joint. The test device is mounted for longitudinal movement in a path of travel transversely of the wire. During the welding step, a magnetic field is generated about the joint which attracts the pawl and causes the pawl to be pivoted into an extended position to project transversely of the wire. When the test device is retracted, the pawl engages the wire and exerts a pulling force against the wire to test the strength of the joint and break the wire.

3,724,266

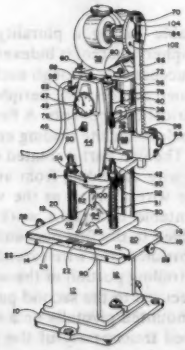
WEB STRENGTH AND TENSILE TESTER AND METHOD

Daniel H. Beckstrom, Winnebago, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sept. 2, 1971, Ser. No. 177,355

Int. Cl. G01n *3/14*

U.S. Cl. 73—95 **8 Claims**



Method and device for rapidly measuring the tensile strength and stretch energy of web materials, particularly materials such as woven or nonwoven reinforced fabrics and tissue papers. The method is characterized by holding the material while it is subjected to action of a reciprocal probe. The apparatus includes a horizontal table having adjustable sections and clamps to produce a variety of test conditions which in combination with the probe allow rapid approximate duplication of conventional and load cell type tensile testers.

3,724,267

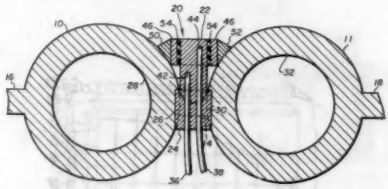
HEAT FLUX SENSING DEVICE

Robert J. Zoschak, Rutherford, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed Aug. 28, 1970, Ser. No. 67,725

Int. Cl. G01k *17/00*

U.S. Cl. 73—190 H **3 Claims**



Heat absorption rates of cooling tubes are measured accurately without the use of devices which cause high stresses. An elongated conductor extends from between the tubes toward a heat zone on one side of the tubes and is provided with two thermocouples which have junctions at different locations along the length of the conductor, to sense a temperature gradient from which the heat flux through the conductor can be determined.

3,724,268

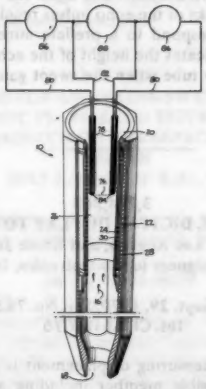
METERING APPARATUS FOR NUCLEAR REACTORS

Jun Kuwabara, Ibaraki-ken, Japan, assignor to Atomic Power Development Associates, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 875,202, Nov. 10, 1969, abandoned. This application Aug. 28, 1970, Ser. No. 67,783

Int. Cl. G01p *5/08*

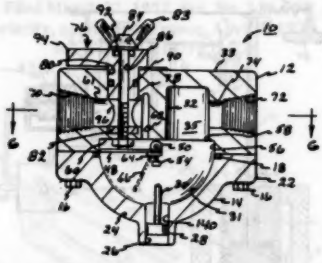
U.S. Cl. 73—194 EM **10 Claims**



This invention relates to apparatus for determining the temperature and/or flow of a conductive fluid through a nuclear reactor subassembly including a pair of permanent magnets, with or without pole pieces, which is installed toward the end of the subassembly to provide a magnetic field in the open channel in the subassembly, and a pair of electrodes which is

inserted into the open channel and supported from internal structure of the nuclear vessel, which is independent of the subassembly.

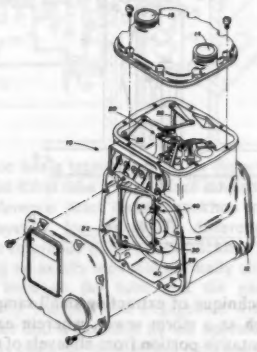
3,724,269
FLUID DEVICE HAVING FLOW CONTROL AND INDICATING MEANS
Nils O. Rosaen, 3774 Quarton Road, Bloomfield Hills, Mich.
Filed June 29, 1970, Ser. No. 50,651
Int. Cl. G01f *1/00*
U.S. Cl. 73—207 **11 Claims**



A fluid device having a housing with an inlet and an outlet respectively adapted to be connected to a source of fluid and a fluid user. A valving mechanism carried within the housing between the inlet and the outlet selectively controls the maximum rate of fluid flow therebetween, while a semi-circular vane is movable in response to a change in the flow rate between the inlet and the outlet to rotate a shaft which extends externally of the housing and is operatively coupled to an indicator for providing an external visual indication of the actual rate of flow through the device. The externally mounted indicator includes an electrically operated device responsive to the rotation of the shaft to provide an electrical signal to a remotely mounted indicator.

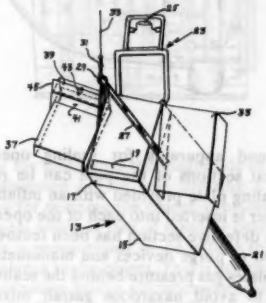
The shaft extends through a sealing plug having a tapered pipe thread on its outer surface which is adapted to engage a mating tapered pipe thread formed in a bore of the housing in such a manner that an O-ring disposed at the inner end of the sealing plug is radially, inwardly compressed as the sealing plug is threadedly engaged within the bore to thereby form a fluid tight seal around the shaft.

3,724,270
FLAG ARM RETAINING SYSTEM
Raymond H. Elder, Dallas, Tex., assignor to Elder Machinery and Tool Engineering Company, Dallas, Tex.
Filed Nov. 17, 1971, Ser. No. 199,490
Int. Cl. G01f *3/20*
U.S. Cl. 73—267 **10 Claims**



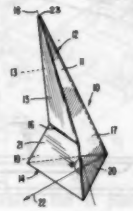
A gas meter includes diaphragms which are cyclically expanded and contracted and flag arms supported for oscillation by the diaphragms. The flag arms are connected to the diaphragms by generally S-shaped flag arm retaining members which are secured to the diaphragms in oppositely facing directions to define open-ended flag arm receiving slots.

3,724,271
SPINNING RADIOSONDE CONFIGURATION
James P. Morrissey, Norwood, and Donald J. MacDonald, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force
Filed Dec. 30, 1971, Ser. No. 213,932
Int. Cl. G01w *1/08*
U.S. Cl. 73—336 **4 Claims**



A radiosonde is provided with a pair of opposite aerodynamic elements attached at an angle to the sides of the housing near the top causing the radiosonde to spin as it ascends. One of the attached elements includes a chamber which contains a humidity measuring means over which a stream of air is caused to flow at an increased rate as the spinning radiosonde ascends.

3,724,272
SELF-SUPPORTING FUSIBLE PYROMETRIC DEVICE
Richard F. Steele, Columbus, Ohio, assignor to The Oton, Edward, Jr., Ceramic Foundation, Columbus, Ohio
Filed Dec. 10, 1970, Ser. No. 96,934
Int. Cl. G01k *11/08*
U.S. Cl. 73—358 **9 Claims**



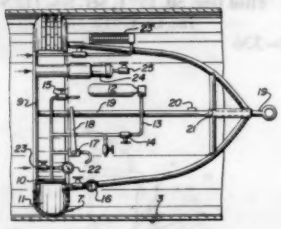
A pyrometric device which measures the amount of heat applied during a heat treatment process. The device fuses and deforms during a heat treatment process to provide a visual indication of the amount of heat applied. The center of mass of the device remains at all times directly above the bottom surface thereof so that the device is self-supporting and requires no external support either before, during or after deformation.

3,724,273

PIPELINE SEALING DEVICE

Kenneth D. Awrey, Prince George, British Columbia, Canada, assignor to Westcoat Transmission Company Limited, Vancouver, British Columbia, Canada

Filed June 30, 1971, Ser. No. 158,329
Claims priority, application Canada, Feb. 12, 1971, 105240
Int. Cl. G01l 9/00
U.S. Cl. 73—389 6 Claims



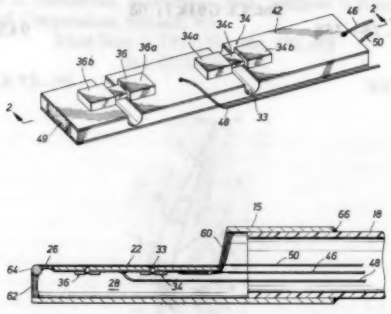
A method and apparatus for sealing operational gas pipelines so that sections of the pipe can be removed and replaced. A sealing plate provided with an inflatable circumferential member is inserted into each of the open ends of the pipeline after a defective section has been removed. By careful manipulation of purge devices and manometers mounted on the sealing plates gas pressure behind the sealing plates can be controlled to avoid hazardous gas/air mixtures in the pipeline so that fire welding can be undertaken without the need for gas or air purging either before or after completion of the welding. One end of the new section is welded in position with the seal in place, which seal is then withdrawn by means of a built-in withdrawal and deflating device.

3,724,274

PHYSIOLOGICAL PRESSURE TRANSDUCERS

Huntley D. Millar, Houston, Tex., assignor to Millar Instruments, Inc., Houston, Tex.

Filed Feb. 11, 1971, Ser. No. 114,610
Int. Cl. G01l 9/02; A61b 5/02
U.S. Cl. 73—398 AR 23 Claims



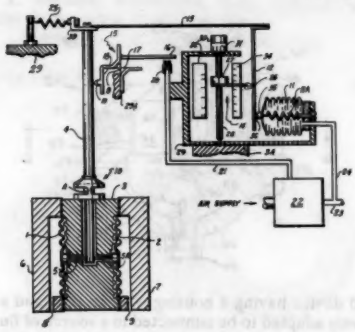
A unique pressure transducer is disclosed which has particular application in making physiological measurements such as intra-arterial or intra-venous blood pressure measurements. The transducer employs the principle of a cantilever beam which is exposed directly to the source of pressure. The pressure applied to the cantilever beam causes flexure which is measured by a strain gauge, or other means for measuring its deformation, and a related electrical signal is produced.

3,724,275

FORCE BALANCE VARIABLE CONDITION TRANSMITTER

Domenic Battaglini, Rochester; Richard G. Beach, Greece, and Howard R. Raquith, Rochester, all of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed June 23, 1969, Ser. No. 835,387
Int. Cl. G01l 7/08
U.S. Cl. 73—407 R 17 Claims



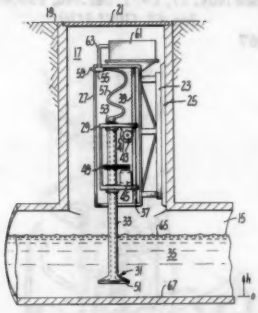
A force balance differential pressure transmitter having a four bar linkage wherein force due to differential pressure exerts a moment on a deflectible bar counterbalanced by an opposing moment exerted on the bar. The fulcrum of the bar is adjustably fixed to the rigid bar of the linkage. The opposing moment is due to a balancing force exerted via a flat anvil against a convex upset on the deflectible bar. The fulcrum is mounted for travel along a screw, and is arranged for vernier adjustment and indication of adjustment. The screw is fixed play free in a frame having rigid feet and spring ears, the latter elastically drawing the former into rigid contact with the rigid bar.

3,724,276

METHOD AND APPARATUS FOR OBTAINING MASS AVERAGE SAMPLES FROM A LIQUID STREAM

Richard G. Schwind, Labonda, Calif., assignor to Nielsen Engineering & Research, Inc.

Filed Nov. 22, 1971, Ser. No. 200,750
Int. Cl. G01n 1/14
U.S. Cl. 73—422 R 8 Claims



An improved technique of extracting small samples from a liquid stream, such as a storm sewer, wherein each sample contains a representative portion from all levels of the stream. The relative sample proportions of liquid mass extracted from each elevation of the stream are directly related to the width

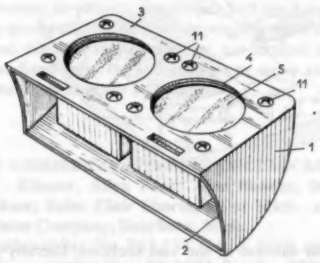
of the stream at that elevation and the average velocity of the stream at that elevation. An apparatus is disclosed for carrying out this technique wherein a substantially continuous flow pump traverses across the liquid stream in a vertical direction with a rate of speed alongits path that is a function of a product of a reciprocal of the velocity and width functions along the height of the stream.

3,724,277

RESILIENT INSTRUMENT CARRYING CASE

Jean Rene Parmentier, 7, rue Leonard de Vinci, Paris, France

Filed March 22, 1971, Ser. No. 126,558
Claims priority, application France, April 9, 1970, 7012813
Int. Cl. G01d *11/10, 11/24*
U.S. Cl. 73—431 **5 Claims**



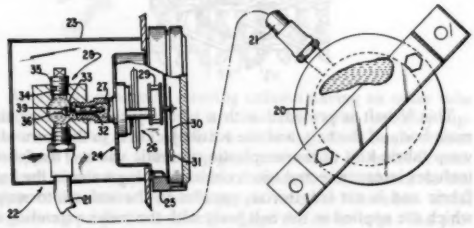
A case or enclosure enclosing at least one instrument which is protected against shocks by a body of neoprene or the like elastomer. The elastomer body is provided with a recess the shape and size of which match those of the instrument embedded within said recess, preferably open at both ends. Such cases are intended for use by parachutists or else for laboratory purposes or again on vehicle instrument boards.

3,724,278

BACKHOE DEPTH GAUGE

Philip W. Harland, Perkasie, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed Dec. 16, 1971, Ser. No. 208,558
Int. Cl. G01c *5/04;* **E02f** *9/26*
U.S. Cl. 73—432 HA **5 Claims**



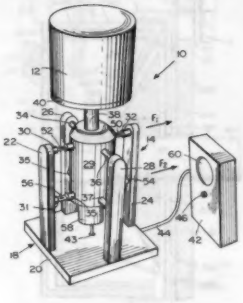
A backhoe has a transmitter on its dipper connected by a flexible, fluid-filled tube to a pressure sensitive gauge mounted at some reference point on the backhoe to define a closed hydraulic system for measuring differences in elevation between the reference point on the backhoe and the dipper. A valve having an axially movable normally closed valve stem is positioned between the tube and the gauge. A pivotally mounted lever has one end engageable with the valve stem and the other end is actuable by the operator of the backhoe to selectively open the connection between the gauge and the tube when a reading on the gauge is desired of the difference of elevation.

3,724,279

ASSEMBLY FOR MEASURING THE MAGNITUDE OF UNBALANCE IN AN OBJECT

Richard P. Woolley, Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Filed Sept. 13, 1971, Ser. No. 179,730
Int. Cl. G01m *1/22*
U.S. Cl. 73—462 **14 Claims**



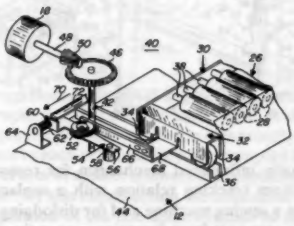
An assembly for measuring the magnitude of unbalance in an object is disclosed herein and, utilizing a conventional spinning device for spinning the object, provides a direct current output signal which is free of noise or other such distortion and which is proportional in magnitude to a given component of unbalance in the object. This is accomplished by exciting a strain-sensitive bridge circuit responsive to the degree of unbalance in the test object with an oscillatory signal synchronous with the spin rate of the object so as to produce a composite signal, which signal is coupled to a damped galvanometer which by averaging the composite signal over a period of time eliminates noise and other distortion components and thereby produces the desired direct current signal.

3,724,280

MANUAL TUNING APPARATUS FOR RADIO RECEIVER

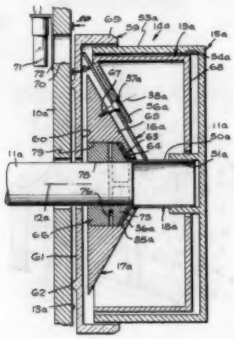
Emery E. Olah, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 14, 1971, Ser. No. 143,506
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.33 **4 Claims**



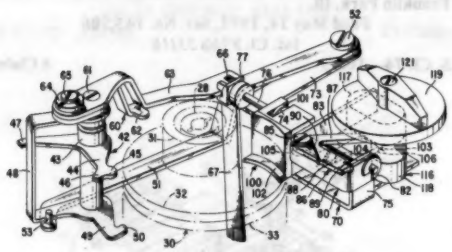
Manual tuning apparatus for a pushbutton type radio receiver includes a capstan drive shaft mounted for rotation in response to the manual rotation of the radio tuning knob. A leaf spring coupled to the core carriage of the slug tuned coil assembly of the radio receiver is held in frictional engagement with the drive shaft and moved along a path adjacent the shaft in response to the rotation of the tuning knob, to in turn adjust the setting of the tuning coil assembly. Upon depression of a pushbutton to select a preset radio frequency, the leaf spring is releasable from engagement with the drive shaft to disable momentarily, the manual tuning apparatus.

3,724,281
VERNIER CONTROL KNOB
Edwin B. Dorchester, Box 127, Smith River, Calif.
Filed May 27, 1971, Ser. No. 147,463
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.52 **23 Claims**



A knob assembly for turning a shaft of a radio or other piece of equipment, and having a planetary drive mechanism adapted to turn the shaft at a speed which is reduced as compared with the speed of a manually actuated knob proper, to thereby attain a highly precise type of vernier indication of the knob setting. The planets of the drive mechanism are inclined in a manner enabling them to frictionally engage and roll along a transverse wall disposed about the driven shaft.

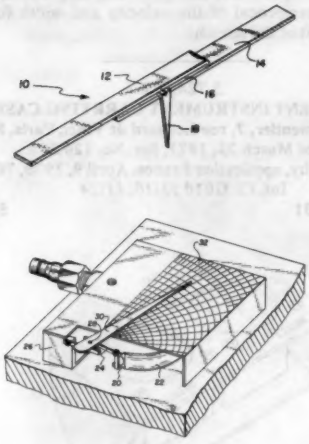
3,724,282
CAM AND FOLLOWER RELEASE MECHANISM FOR SEWING MACHINES
Louis F. Daman, Martinsville, N.J., assignor to The Singer Company, New York, N.Y.
Filed Aug. 26, 1971, Ser. No. 175,246
Int. Cl. F16h *25/16*
U.S. Cl. 74—54 **1 Claim**



A manually influenced mechanism for removing the cam followers from tracking relation with a replaceable pattern cam unit in a sewing machine and for dislodging the replaceable pattern cam unit from retention means therefor on a cam shaft to facilitate exchange of pattern cam units.

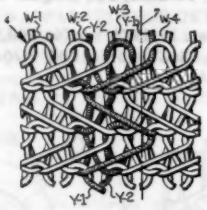
3,724,283
DEVICE FOR CONVERTING LINEAR MOTION TO ROTATIONAL MOTION
Miller R. Hutchison, Jr., Nantucket, Mass., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 26, 1971, Ser. No. 166,169
Int. Cl. F16h *21/44*
U.S. Cl. 74—99 **3 Claims**

A mechanical device for converting linear motion to rotational motion includes a strip of flexible material formed in a generally Z-shaped configuration in which the sections of the strip near the apexes of the Z remain tangentially oriented



during linear motion of the end sections, thereby producing rotational movement of the central section.

3,724,284
V-BELT AND METHOD OF FORMING SAME
Kjell Eng, Kattilstorp, and Sven-Olof Salomonsson, Bramhult, both of Sweden, assignors to AB Sveriges Forenade Trikafabriker, Boras, Sweden
Filed May 17, 1971, Ser. No. 143,993
Int. Cl. F16g *5/00*
U.S. Cl. 74—234 **10 Claims**

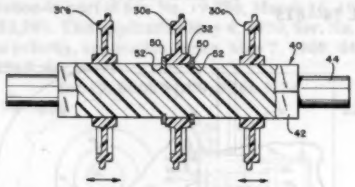


This V-belt is provided with a textile jacket covering the main body of the belt, and the textile jacket is in the form of a warp fabric knit of thermoplastic synthetic yarns. This fabric includes interconnected stitch chains forming wales in the knit fabric and is cut lengthwise, parallel to the wales into strips which are applied to the belt body with the wales extending in the longitudinal direction of the belt. The textile jacket is vulcanized to the belt body and completely surrounds the belt profile.

3,724,285
CONVEYOR DRIVE
James M. Lapeyre, 13 Richmond Place, New Orleans, La.
Continuation-in-part of Ser. No. 187,746, Oct. 8, 1971, which is a continuation-in-part of Ser. No. 63,523, Aug. 13, 1970, abandoned. This application April 17, 1972, Ser. No. 244,773
Int. Cl. F16h *55/30*
U.S. Cl. 74—243 FC **17 Claims**

A sprocket drive assembly designed for a modular chain link conveyor belt subject to relatively large variations in

width due to changing ambient conditions such as large cyclic temperature changes. The assembly includes a drive shaft with a square cross section and a plurality of sprockets mounted on the shaft for rotation thereby. One sprocket is fixed against



axial movement to provide for proper belt tracking while the remaining sprockets, the number depending upon the width of the belt and the load carried thereby, are located on opposite sides of the fixed sprocket and are free to move axially to accommodate for changes in belt width.

3,724,286

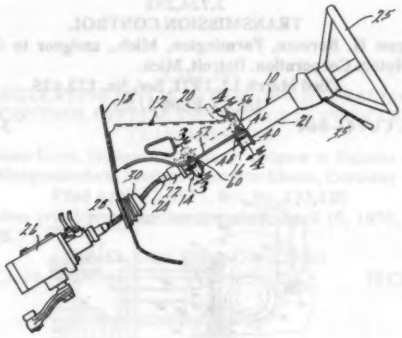
ENERGY ABSORBING STEERING COLUMN ASSEMBLY

Ernest W. Kitzner, Allen Park; Alex Rhodes, Detroit, and James Rose, Saint Clair Shores, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 863,137, Oct. 2, 1969, abandoned. This application Nov. 22, 1971, Ser. No. 200,962

Int. Cl. B62d *1/18*

U.S. Cl. 74—492 **25 Claims**



An energy absorbing steering column having an outer tube secured to vehicle support structure. The tube rotatably supports a steering shaft which has a steering wheel connected to its upper end and a steering gear connected to its lower end. Spaced apart support members connect the column to the support structure. One support member includes metal deforming projections which engage the outer tube. The projections are constructed to plastically deform the tube upon axial displacement thereof and thereby absorb the energy of an impact upon the steering wheel. The other support member includes a bushing that permits axial displacement of the outer tube.

3,724,287

THROTTLE CONTROL APPARATUS

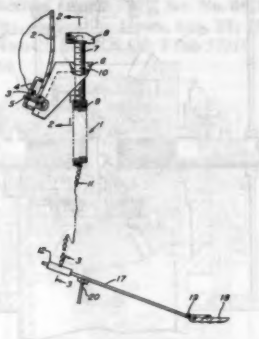
Jack Dreeben, Northgate Apartments, Apt. 2N, Camden, N.J.

Filed Aug. 13, 1971, Ser. No. 171,486

Int. Cl. G05g *5/04*

U.S. Cl. 74—526 **14 Claims**

An apparatus for aiding the operator of a vehicle in controlling a throttle mechanism. The apparatus includes a moveable member which is longitudinally adjustable. A spring is rigidly secured to the moveable member at a lower end. A chain is attached on opposing ends to the spring and an accelerator pedal respectively. Adjustment of the moveable member in a downward direction permits the chain to remain in a slackened position until the accelerator pedal is displaced



a sufficient distance to cause the chain to become taut. Increased displacement of the accelerator pedal is then accomplished through extension of the spring which increases the normal pedal resistance force. The operator may override the increased resistance force but is made aware of the increase in vehicle speed.

3,724,288

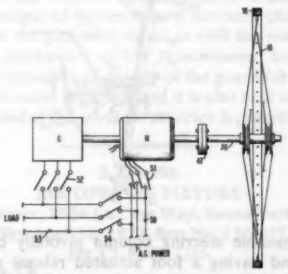
HIGH ENERGY STORAGE FLYWHEEL

Marek Jakubowski, 7030 Roaring Ford Trail, Boulder, Colo.

Filed Feb. 4, 1972, Ser. No. 223,633

Int. Cl. F16c *15/00*

U.S. Cl. 74—572 **6 Claims**



A high energy storage flywheel is described, consisting of a rim of anisotropic material such as music wire. A divided hub has coaxially placed portions which are rotationally displaceable with respect to each other and are intercoupled by resilient means. Distinct sets of spokes connect the respective hub portions to the rim. By this construction the tension of the spokes due to the expansion of the rim upon rotation of the wheel is compensated by the mutual rotational displacement of the hub portions.

3,724,289

LIMITED SLIP DIFFERENTIAL WITH CLUTCH CONTROL MEANS

Robert B. Kennicutt, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

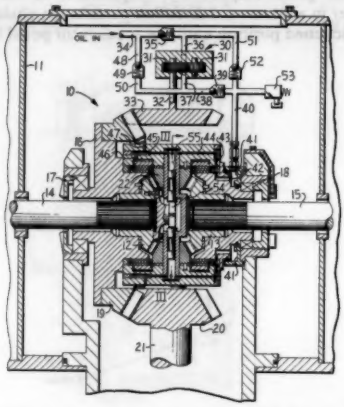
Filed March 29, 1971, Ser. No. 128,950

Int. Cl. F16h *1/44*

U.S. Cl. 74—711 **11 Claims**

A limited slip differential comprises juxtaposed axle gears meshing with intermediate spider gears rotatably mounted on

a carrier. A hydraulically actuated friction clutch is positioned between each spider gear and the carrier to retard rotation of the spider gears in response to a rotational speed differential



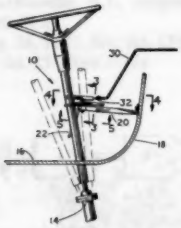
of the axle gears. Control means for automatically actuating the clutches comprises a multi-lobed cam attached to an axle gear and a plurality of pistons reciprocally mounted in the carrier for pressurizing actuating chambers of the clutches.

3,724,290

ADJUSTABLE TILT STEERING DEVICE

Maurice G. Burton, Salt Lake City, Utah, assignor to Ute Liner, Inc., Salt Lake City, Utah

Filed Sept. 13, 1971, Ser. No. 179,925
Int. Cl. B62d *1/18*
U.S. Cl. 74—493 **9 Claims**



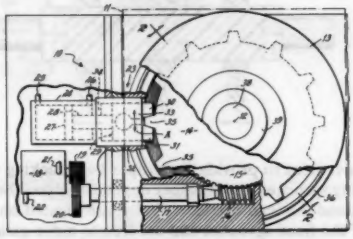
An adjustable steering column pivotally connected to a vehicle and having a foot actuated release crank with the upper end of the crank rotatably extending through brackets. A flat release bar is fixed to the upper end of the crank and bears against vertical slidable release pins with the upper end of the pins bearing against two guide bars welded to a transverse bar. The gripping bar is fixed to the brackets and has bolt members extending therethrough with spring members thereon which urges the gripping bar against the bottom of a longitudinally extending tongue member. An upper fixed transverse bar is disposed on the upper ends of the bolts and bears against the top of the tongue so that the tongue is normally held immobile between the gripping and upper bar. Pressing down on the foot pedal causes the upper end of the crank to rotate in a counter-clockwise direction and causes the rear portion of the release bar to move downwardly and its front portion to move upwardly against the release pins. Since the pins cannot move upwardly and the gripping bar is fixed to the bracket it, too, moves downwardly against the springs compressing them and causing them to move away from the tongue so it can then be adjusted to another position at a different desired angle. Release of the foot pedal releases the springs and they again bear against the gripper bar and it, in turn, against the tongue to cause it to be immobile.

3,724,291

POSITIONING APPARATUS

Fred M. Goebel, Cincinnati, Ohio, assignor to Le Blond, Inc., Cincinnati, Ohio

Filed March 29, 1971, Ser. No. 129,049
Int. Cl. B23b *29/32*
U.S. Cl. 74—815 **4 Claims**



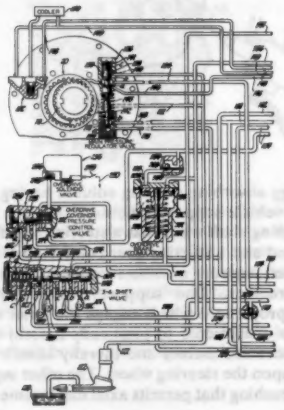
A positioning system for an indexable slide or turret comprises a bifurcated member located adjacent the turret and engageable with the teeth of a locating gear to accurately position the turret relative to the bifurcated member. The bifurcated member slides in a bore provided within a sleeve. Upon contacting a selected tooth of the gear, the sides of the bifurcated member are wedged apart by the tooth until they contact the sleeve so that each side is wedged between the tooth and the sleeve, thereby positively and accurately positioning the selected tooth of the gear and the attached tool turret.

3,724,292

TRANSMISSION CONTROL

August H. Borman, Farmington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed March 12, 1971, Ser. No. 123,625
Int. Cl. B60k *21/02*
U.S. Cl. 74—864 **3 Claims**

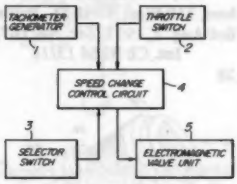


An automatic transmission control having an overdrive shift valve whose operation is controlled by an overdrive governor pressure control valve which in turn is controlled by an overdrive solenoid valve that is under vehicle operator control, there being further included an overdrive accumulator that operates to establish fluid delivery for establishment of all of the transmission's lower speed drives and also operates as both a valve and an accumulator to effect establishment of and cushion overdrive engagement.

3,724,293
AUTOMATIC TRANSMISSION CONTROL SYSTEM FOR AUTOMOBILES

Hisato Wakamatsu, Kariya; Akira Kitano, Nagoya, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Continuation-in-part of Ser. No. 19,780, March 16, 1970, Pat. No. 3,652,901. This application May 4, 1970, Ser. No. 34,098
Claims priority, application Japan, May 7, 1969, 44/34972; May 7, 1969, 44/34973
Int. Cl. B60k *21/00*; F16h *3/74*
U.S. Cl. 74—866 22 Claims

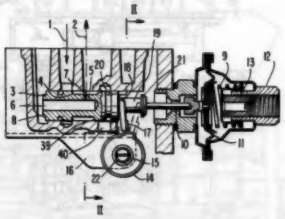


An automatic transmission control system for automobiles comprising a plurality of speed change signal generator circuits, which are connected to a logic circuit, which is in turn connected to a memory connected to an electromagnetic valve drive circuit including an AND circuit and a power supply circuit feeding solenoids of electromagnetic valves.

3,724,294
REGULATING INSTALLATION OF A HYDRAULIC CONTROL SYSTEM, ESPECIALLY IN VEHICLE TRANSMISSIONS

Hermann Gaus, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed April 12, 1971, Ser. No. 133,120
Claims priority, application Germany, April 10, 1970, P 20 17 238.7
Int. Cl. B60k *21/00*; G05d *23/00*
U.S. Cl. 74—863 19 Claims

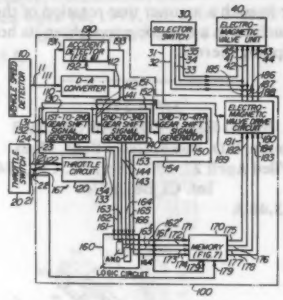


A regulating installation for the working or shifting pressure of a hydraulic control system, especially of an automatic vehicle transmission, in which a bimetallic spring circumcirculated by the hydraulic medium is built into the regulating installation, which spring is fixedly mounted at one end and which abuts with the other end at least within a predetermined temperature range at the regulating installation.

3,724,295
AUTOMATIC TRANSMISSION CONTROL SYSTEM FOR AUTOMOTIVE TRANSMISSION OF VEHICLES

Hisato Wakamatsu, Kariya; Akira Kitano, Nagoya, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Continuation-in-part of Ser. No. 34,098, May 4, 1970. This application Aug. 3, 1970, Ser. No. 60,279
Claims priority, application Japan, Aug. 21, 1969, 44/66378
Int. Cl. B60k *21/00*; F16h *57/10*
U.S. Cl. 74—866 6 Claims

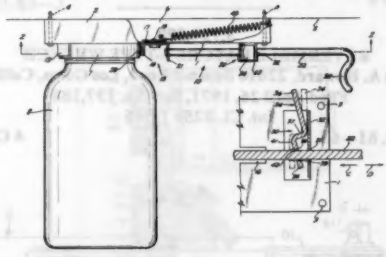


An automatic transmission control system for automobiles, which comprises a vehicle speed detector to produce an output signal at a frequency proportional to the vehicles speed, a D-A converter to produce an analog signal from the output signal from the vehicle speed detector, an engine load detector to produce an output signal corresponding to the engine load, a gear-shift signal generator circuit to generate a gear-shift signal by detecting a gear-shift point from the output signals from the vehicle's speed and engine-load detectors, a memory receiving the gear-shift signal, and an accident detector to produce an output signal if the voltage level of the output signal of the vehicle speed detector suddenly drops, wherein the output of the memory is normally changed in accordance with the gear-shift signal to shift the position of the gear-shifting mechanism of the transmission, but is it held unchanged irrespective of change of the gear shift signal if the engine throttle valve is closed, and it is also held unchanged if the engine throttle valve is closed.

3,724,296
JAR OPENING FIXTURE

Richard T. Graver, 7926 La Casa Way, Buena Park, Calif.

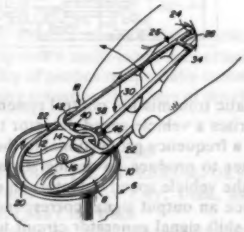
Filed April 16, 1971, Ser. No. 134,577
Int. Cl. B67b *7/36*
U.S. Cl. 81—3.3 R 12 Claims



A fixture for use in loosening and removing the lid from a vacuum sealed, screw-type, bottle or jar including a base member which is adapted to be rigidly connected to a supporting surface. The base member supports first and second gripping members, the former being stationary and the latter

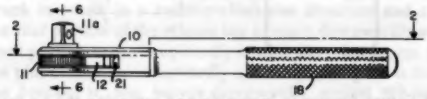
being mounted for linear movement under control of an actuating rod connected thereto. A locking device is provided for controlling the movement of the actuating rod, the locking device permitting unlimited linear movement of the actuating rod in a direction to bring the gripping members together and releasably inhibiting movement of the actuating rod in an opposite direction whereby the second gripping member may be moved toward the first gripping member to secure the lid therebetween and the locking device will hold the second gripping member in position, such gripping member, in turn, holding the lid, until released. The second gripping member includes a serrated surface which is pivotably mounted on the base member in such a manner that rotation of the lid tends to rotate such surface in a direction to tighten its hold on the lid to prevent slipping thereof.

3,724,297
HAND HELD POP TAB OPENER
Edward P. Bucko, P.O. Box 5, Great Falls, Mont.
Filed April 22, 1971, Ser. No. 136,394
Int. Cl. B67b *7/40*
U.S. Cl. 81—3.46 A **5 Claims**



A pull tab lifting, freeing and tab discarding implement constructed to be grasped in one hand and actuated in the manner of a lever while the can or container is held in the other hand. It comprises an elongated flat frame, that is, an adaptation which is made from rod or stout wire stock, the frame being widened and arcuately rounded at the forward end to engage the rim and rest atop the can. The rearward end is gradually narrowed and also arcuately rounded and the two end portions are joined by a median progressively narrowed portion. A cross member, also made or rod stock, bridges and is integrally connected with the median portions of the side members of the frame. A median portion of the cross member is bent upon itself and fashioned into and provides a downbent oblique angled eye engaging and lifting hook. The hook is lifted up with and hitched from the forward end to achieve the desired lifting, tab yanking and removing result. An elongated spring tongue is provided and serves as a racking and storing finger for discardable tabs.

3,724,298
REVERSIBLE RATCHET-TYPE WRENCH
Joseph A. Howard, 22616 Summit Road, Los Gatos, Calif.
Filed April 26, 1971, Ser. No. 137,188
Int. Cl. B25b *13/46*
U.S. Cl. 81—63 **4 Claims**

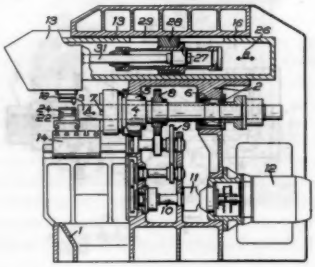


A reversible ratchet-type wrench provided with a ratchet wheel and a pawl with two sets of teeth selectively engageable with the ratchet wheel. The pawl is also provided with two substantially flat surfaces which are on opposite sides of an angular projection that is located opposite the pivot which supports the pawl. The pawl is tilted on its pivot when the handle of the wrench is rotated through a predetermined relatively wide angle so that one of the two sets of teeth of the pawl engage the ratchet wheel depending upon the direction in which it is desired to turn the wrench. A spring-urged ball is supported by the handle in engagement with said angular projection of the pawl to provide a snap action in tilting the pawl after the handle is turned a certain amount whereby positive engagement of the selected set of teeth of the pawl with the ratchet wheel is obtained.

3,724,299
ADJUSTABLE SOCKET
Nicholas R. Nelson, 710 West North St., Bellingham, Wash.
Filed Aug. 2, 1971, Ser. No. 167,955
Int. Cl. B25d *13/18*
U.S. Cl. 81—128 **4 Claims**

An adjustable socket for use with any standard ratchet wrench, the device being adaptable to be made up in kits that include three of such adjustable sockets in different sizes so that together they replace need of nine to twelve solid sockets of different sizes; each of the adjustable sockets having three or more variable size settings of 1/16 of an inch apart, each adjustable socket including a socket at one end for removable attachment to a conventional socket wrench drive unit, and the other end having a set of radially adjustable, arcuate jaws each one of which is provided with a series of teeth.

3,724,300
FRONTAL MULTI-SPINDLE LATHES
Roger Bardiau, La Celle-St-Cloud, France, assignor to Societe S.E.C.O.R., Courbevoie, France
Filed Nov. 3, 1970, Ser. No. 86,418
Claims priority, application France, July 11, 1969, 6938496
Int. Cl. B23b *9/10*
U.S. Cl. 82—3 **7 Claims**

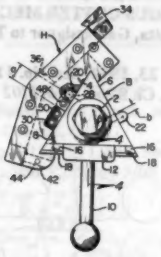


This invention relates to an improvement in lathes comprising a frame constituting a headstock in which the spindles are mounted to rotate. It is characterized in that around the headstock and the spindles are arranged a plurality of beds, mounted to slide over the whole length of said headstock along axes parallel to the axes of the spindles, said beds carrying tool-holder carriages. The invention may be used in frontal multi-spindle lathes.

3,724,301
TOOL HOLDER ASSEMBLY

Philip A. MacKelvie, Denver, Colo., assignor to Multi-Point Tool Co., Inc., Commerce City, Colo.

Filed Oct. 21, 1971, Ser. No. 191,508
Int. Cl. B23b *29/26*
U.S. Cl. 82—36 8 Claims

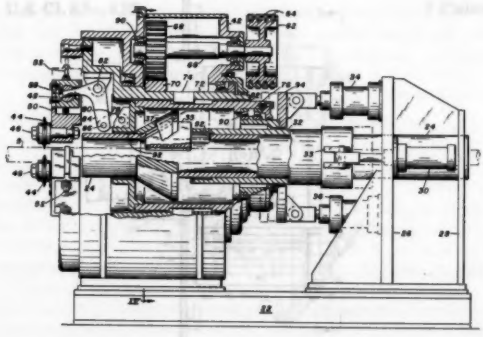


A tool holder assembly is provided for positioning any one of a plurality of tools for use on a work piece in a lathe, the assembly including a tool holder mountable on a tool block which has a pair of mounting faces. A first abutment extends from one face spaced from the vertical centerline thereof a first distance and a second abutment extends from the other face spaced a second and different distance from the centerline of that face. The tool holder is reversibly mountable on either face and has two pairs of adjustable set screws, the first pair being spaced a first equal distance on opposite sides of the vertical centerline of the locating face of the tool holder which first distance is equal to the spacing of the first abutment from the centerline of the one face of the tool block and the second pair spaced a second equal distance on opposite sides of the vertical centerline of the locating face of the tool holder which second distance is equal to the spacing of the second abutment from the centerline of the second face. With this structure, the tool holder may be adjustably mounted on either face and it may be reversed in so that it is useable with as many as four tools.

3,724,302
METHOD AND APPARATUS FOR SEVERING TUBES

Erasmus A. Randich, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 854,349, Aug. 4, 1969, Pat. No. 3,613,489.
This application July 29, 1971, Ser. No. 167,525
Int. Cl. B23b *1/00*
U.S. Cl. 82—47 R 5 Claims

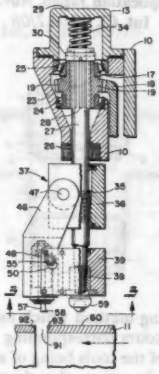


The application describes a method and apparatus for accurately severing tubes and pipes, preferably with a burr free cut. Tubes are clamped into position and severed by means of cutters. The cutters and tubes are in relative revolvement. Clamping is preferably done in a manner which exerts a tensile stress in the axial direction of the tube. The tensile stress substantially precludes burr formation. A preferred cutter is an edge tool with a rounded cutting edge.

3,724,303
CHAMFERING APPARATUS FOR TUBULAR ARTICLES

Michael S. Rinaldo, Youngstown, Ohio, assignor to Wm. K. Stamets Company, Columbiana, Ohio

Filed April 16, 1971, Ser. No. 134,608
Int. Cl. B23b *3/04, 5/14*
U.S. Cl. 82—59 R 18 Claims

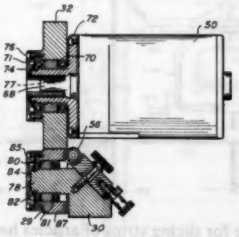


A rotatable tool head having a radially movable tool holder connected to a guide member radially movable into engagement with the cylindrical wall of the work. The guide member has a cam slot for a roller carried by the tool holder which is radially movable at a different speed than the guide member whereby the roller moves in the slot to direct a chamfering tool into cutting engagement with the work piece while the guide member is held in sliding engagement with the cylindrical wall of the work piece by a spring biasing the guide member towards the cylindrical wall. The tool head also carries radially movable tool holders for cutting through the wall of the work piece.

3,724,304
APPARATUS FOR DEBURRING A METAL STRIP

Henry Persson, 224 Glenwood Avenue, Bloomfield, N.J.

Filed Jan. 3, 1972, Ser. No. 214,680
Int. Cl. B26d *3/02, 7/06*
U.S. Cl. 83—3 9 Claims



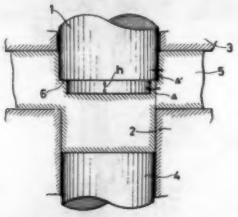
This invention discloses apparatus for conditioning the edge as by deburring of a continuously fed metal strip such as is provided in the slitting of a large strip into many narrow strips. Other strips requiring deburring occur when shearing sheets

into strips. The burr or sharp edge or edges on said strip is removed by advancing the strip by a powered roller while at the same time bringing the edge in way of a rotating cup-shaped cutting disc or a scraping cutting blade. A non-powered deburring apparatus may be used with the powered apparatus so that its deburring means is brought in way of the other edge which is deburred in the same manner as the powered deburring apparatus. Rectangular and square sheets can also be deburred with the apparatus of this invention.

3,724,305
PRECISION SHEARING METHOD

Kazuyoshi Kondo, 22-12, Hirosawa 1-chome, Hamamatsu, Japan

Filed Nov. 4, 1970, Ser. No. 86,770
Claims priority, application Japan, Nov. 15, 1969, 44/91703
Int. Cl. B26d *7/08*
U.S. Cl. 83—14 **11 Claims**

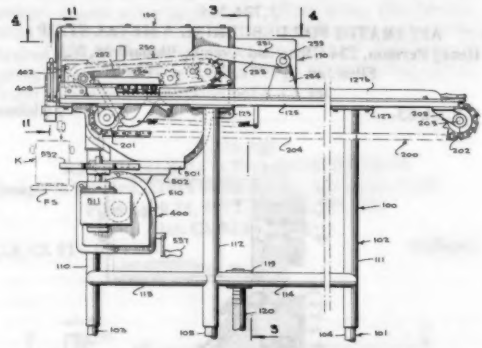


A precision shearing method which uses a pair of shearing die tools having contours corresponding to that of the article to be obtained, one of the tools being of a conventional design and the other tool being stepped to form clearances thereon which are positive and negative or zero with respect to said first tool, comprising urging the latter tool toward the work thereby causing first the positive clearance and then the negative clearance or zero clearance to act upon the work material.

3,724,306
SLICING MACHINE

George E. Meckley, Abbottstown, Pa., assignor to Hanover Brands, Inc., Hanover, Pa.

Filed March 5, 1971, Ser. No. 121,388
Int. Cl. B26d *5/20*
U.S. Cl. 83—210 **14 Claims**

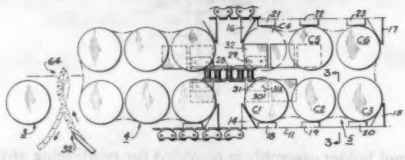


A machine for slicing strips of articles having variable vertical thicknesses to provide individual portions of substantially similar size comprising support means, means mounted on the support means for feeding the strips along a predetermined line of travel, means engageable with the strips disposed on the strip feeding means, for indexing the strip along the line of travel in predetermined increments, means responsive to the vertical thicknesses of the strips, operably connected to the strip indexing means to vary the magnitude of the indexing increments in relation to the vertical dimensions of the strips, and means cooperative with the strip indexing means for severing the leading end of the strips upon the strips being indexed a predetermined increment.

3,724,307
SYNCHRONOUS CUTTER MECHANISM

Roy A. Johnson, Marietta, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 23, 1971, Ser. No. 117,904
Int. Cl. B26d *1/36, 5/02*
U.S. Cl. 83—337 **2 Claims**

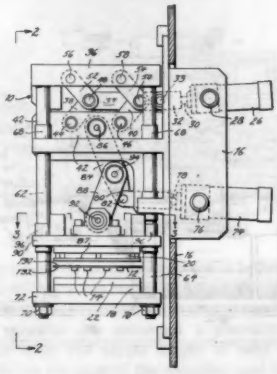


Continuous movement is imparted to a chain made up of a plurality of packets which are interconnected in end to end spaced relation by means of a pair of endless conveyor elements disposed on opposite sides of the path of movement of the chain of packets. Each conveyor is provided with a plurality of packet engaging spacers and with a plurality of positioning bars arranged to engage each packet and to hold it in a predetermined relationship with respect to the conveyor. A rotatable support element is disposed on each side of the path of movement of the packet and a plurality of cutter elements are movably mounted on each support element and a rotatable cam is disposed coaxially with respect to each support element and rotates relative to its associated support element to impart a smooth controlled in and out cutting movement to the associated cutter element each of which is provided with a serrated cutting edge. The cutters separate one packet from another by simultaneously entering the spaces between adjacent packets.

3,724,308
PUNCH AND DIE CUTOUT STATION

Matthew Nichols, Norristown, Pa., assignor to Sauter Packaging Company, Sauderton, Pa.

Filed Sept. 28, 1970, Ser. No. 75,969
Int. Cl. B26d *5/08, 5/12*
U.S. Cl. 83—557 **2 Claims**



A cut out station for die cutting a previously laminated elongate web of material dna including a lower die member con-

nected to an upper carriage through a plurality of sliding rods and an upper punch member in vertical registry above the lower die member and in sliding engagement with the sliding rods. The lower die member includes means producing vertical reciprocal motion below the web and the upper punch member includes means producing vertical reciprocal motion above the web. The upper punch member is further being characterized by a resilient mounting construction to cooperate with and to absorb the forces generated by the reciprocal operation of the punch and die members.

3,724,309

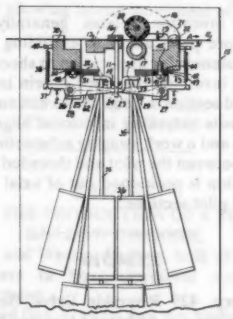
TAPE PUNCH

George Takenaka, Santa Anna, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed April 15, 1971, Ser. No. 134,354

Int. Cl. B26d *5/06*

U.S. Cl. 83—575 **11 Claims**



A high speed solenoid operated punch for paper tape or the like in which a relatively weak spring is provided to normally hold the punch in retracted position and to take up clearances in the punch linkage. A second stiffer, cantilever type spring is engaged by the punch linkage only after the punch has partially sheared through the tape and, finally, a much stiffer cantilever type spring is engaged after the punch passes completely through the tape to arrest the punch and to catapult the same back to its retracted position, aided by the second spring.

3,724,310

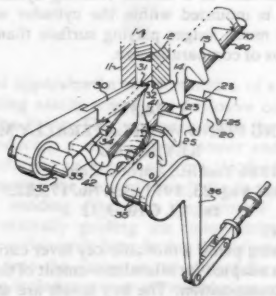
CABLE SPLITTER

John Chippendale, Otley, England, assignor to Impact Industrial Holdings Limited, Newcastle upon Tyne, England

Filed June 18, 1971, Ser. No. 154,430

Int. Cl. B26d *7/06*

U.S. Cl. 83—435 **7 Claims**



Cable splitting apparatus is provided, for recovering metal from sheathed cables, in which a splitting tool is arranged in collaboration with a central annular groove in one of two gripping wheels the periphery of which is provided with gripping teeth so that during rotation of the wheels the gripping teeth press the sheath against the sides of the splitting tool for the tool and teeth in combination to shear through the sheath.

3,724,311

CONSTRUCTION OF MECHANICAL PRESSES

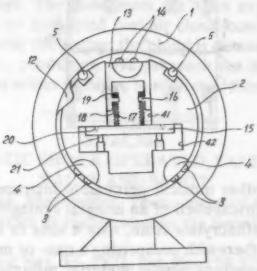
Federico Streich, Calaf Street, No. 25; Alberto Vargas Gold, Rosario Street, 19&21; Jose Mª Bonastre Oliveras, Menendee Pelavo, Street No. 5.3.2, and Fernando Fernandez Ventura, San Cugat del Valles, Abella Street, No. 42, all of Barcelona, Spain

Filed March 11, 1971, Ser. No. 123,178

Claims priority, application Spain, March 14, 1970, 377500; Feb. 25, 1971, 388610

Int. Cl. B26d *5/16*

U.S. Cl. 83—590 **12 Claims**



Improvements in the construction of mechanical presses, comprising a large diameter transverse shaft projecting from the frame of the machine and presenting at its front two crossed slots for housing the sliding carriage of the press and the table of the same, an inertia flywheel in ring form, mounted on said shaft and having on the interior thereof cams for driving the carriage, and driving electric motor positioned between said ring-flywheel and the zone of the frame adjacent to the shaft, the ring-flywheel being connected to the rotor of the motor and the frame being connected to the stator.

3,724,312

SOUNDBOARDS FOR STRING INSTRUMENTS HAVING PLASTIC FOAM BODY WITH HARDER OUTER LAYERS

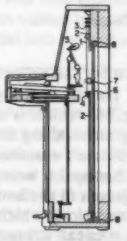
Takashi Yamada, Hamamatsu, and Toyosaku Matsumoto, Toyohashi, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed March 23, 1971, Ser. No. 127,183

Claims priority, application Japan, March 26, 1970, 45/25052; March 26, 1970, 45/25053; April 10, 1970, 45/30317; March 26, 1970, 45/28389

Int. Cl. G10c *3/06*

U.S. Cl. 84—193 **15 Claims**



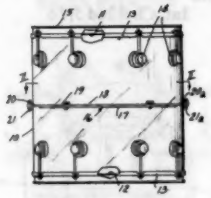
A soundboard is made of a body of plastic foam material which is supplemented by means for improving the vibration

transmission characteristics. The means may be a pair of cross-grained thin sheets of harder material than the plastic foam material bonded on both surfaces of the body or may be inserts of harder material disposed in through-holes perforated in the soundboard, the inserts abutting directly on a bridge and ribs, respectively, coupled to both surfaces of the soundboard.

3,724,313
DRUM

Richard J. Frigo, 18 West 224 16th Street, Villa Park, and William F. Crowden, 2420 West Berwyn Avenue, Chicago, both of Ill.

Filed Jan. 4, 1971, Ser. No. 103,752
Int. Cl. G10d *3/00, 13/02*
U.S. Cl. 84—452 P **4 Claims**

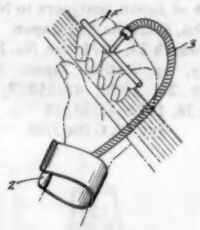


A drum or other musical percussion instrument made of a seamless cylindrical shell of an integral synthetic plastic, such as a methyl methacrylate resin, with a tone or sound modulator associated therewith comprising a one- or multi-part panel of similar transparent plastic material mounted for rotation about an axis parallel to a drum head and intersecting said shell, with clearance therebetween and between the panel and the head, or heads, of the drum to permit adjustability of the panel into various angular positions relative to the plane of the head in order to modulate the sounds caused by playing on said head.

3,724,314
FINGER TRAINING DEVICE FOR STRINGED MUSICAL INSTRUMENTS

Christopher Columbo, 1759 79th Street, Brooklyn, N.Y.

Filed May 18, 1972, Ser. No. 254,754
Int. Cl. G09b *15/06*
U.S. Cl. 84—465 **5 Claims**

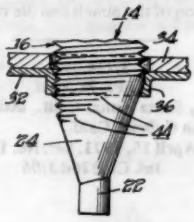


A finger training device for the proper manipulation of the fingers in the course of playing a stringed instrument, constituted by a restraining bar which is adjustably positioned above the fingers as they move along the finger board of the instrument. A flexible, but self-sustaining rod is connected between the restraining bar and a wrist-band adapted to be mounted on the wrist adjacent to the hand which supports the neck of the instrument, and along which the fingers glide for variably contacting the musical strings running therealong. Furthermore, universal joints at each end of the flexible rod facilitate the setting of the bar any desired distance above the fingers to restrain the undue lifting thereof from the strings.

3,724,315
EXTRUDING SCREW

Henry A. Sygnator, Arlington Heights, Ill., assignor to Illinois Wool Works Inc., Chicago, Ill.

Filed Sept. 7, 1971, Ser. No. 177,950
Int. Cl. F16b *25/00*
U.S. Cl. 85—47 **6 Claims**

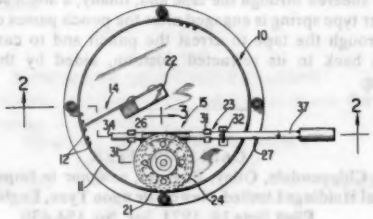


The present invention relates generally to threaded fasteners and more particularly to extruding and/or thread-forming screw fasteners for application to sheet metal. An embodiment of the invention disclosed herein includes a shank having a threaded section, a head at one extremity, a pilot section at the opposite extremity in coaxial alignment with the threaded section and a work swaging substantially conical section interposed between the pilot and threaded shank sections. The conical section is positioned out of axial alignment with the threaded and pilot sections.

3,724,316
MUSIC BOX

Benjamin Kinberg, 425 Riverside Drive, New York, N.Y., and Richard J. Mayer, 34 Mount Vernon, Bloomfield, N.J.

Filed Jan. 28, 1969, Ser. No. 794,672. The portion of the term of this patent subsequent to Nov. 3, 1988, has been disclaimed.
Int. Cl. G10f *1/06*
U.S. Cl. 84—95 **7 Claims**



A music box wherein the musical comb operating pins are on the inner surface of a hollow rotating cylinder and the musical comb is mounted within the cylinder whereby the cylinder has a much longer playing surface than a conventional music box of comparable size.

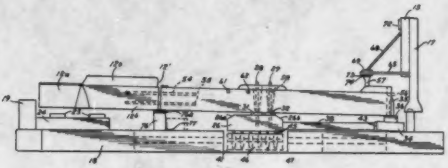
3,724,317
TRANSPOSING PIANO WITH LATERALLY MOVABLE KEYBOARD

Jae P. Rogers, 1186 Yost St., Aurora, Colo.

Filed Aug. 23, 1971, Ser. No. 173,823
Int. Cl. G10c *3/12*
U.S. Cl. 84—447 **11 Claims**

In a transposing piano a movable key lever carriage on the key lever bed is adapted for lateral movement of the key levers for a desired transposition. The key levers are straight, of a reduced length to clear the action supports during lateral movement, and are provided with a center slot which receives a center key pin on the carriage and a rear slot at the rear end

which receives and is guided by a rear key pin on the carriage during pivotal movement thereof, the key levers being readily removable from the carriage. A space equalizing assembly is provided on each sticker rod to equalize gap spacing and



transmit motion from a selected key lever to a selected sticker rod. A releasable coupling connects each space equalizing assembly to a capstan. A clutch bar supports the key levers to facilitate the release of each space equalizing assembly from each capstan for allowing lateral movement of the key levers.

ERRATUM

For Class 85—47 see:
Patent No. 3,724,315

3,724,318

PROCESS FOR THE PRODUCTION OF A FUSE HAVING A HOLLOW CHANNEL

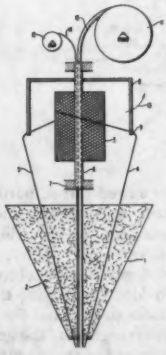
Wilhelm Rohde, and Werner Helfgen, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 3, 1970, Ser. No. 94,842

Claims priority, application Germany, Dec. 3, 1969, P 19 60 569.7

Int. Cl. C06b *21/02*

U.S. Cl. 86—1 **15 Claims**



Process and apparatus for the production of a fuse having a cavity extending axially within the explosive core and being provided with a lining. The process includes the steps of continuously producing a casing at the lower end of the feed hopper, introducing an explosive from the feed hopper into the casing, passing the lining through the feed hopper while continuously winding filaments therearound in a helical manner for centrally guiding the lining through the feed hopper, and continuously introducing the lining together with the explosive into the casing at the end of the feed hopper. The apparatus includes a draw-off mechanism arranged vertically above the feed hopper, and one or more supply bobbins for the filaments can be provided as well as a bobbin for a tracer thread.

3,724,319

FAX MINEFIELD CLEARING DEVICE

Richard J. Zabelka, Sault Sainte Marie, Mich., and Lloyd H. Smith, China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed March 8, 1967, Ser. No. 621,707

Int. Cl. F41f *1/00*

U.S. Cl. 89—1 M **2 Claims**

A plurality of fuel containers, series connected together by lines, are deposited along a mine field by a towing projectile, such as a rocket. The containers are then explosively ruptured, forming an elongated fuel-air cloud contiguous to the mine field. Shortly thereafter, the cloud is detonated by a high explosive wave, producing overpressure on the mine field which detonates mines sensitive to such overpressure.

3,724,320

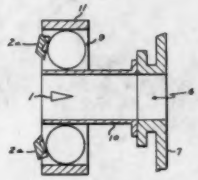
HYDROSTATIC SHOCK OPERATED, FAST CLOSING VALVE AND SABOT

Buford W. Duke, Manchester, Tenn., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 15, 1971, Ser. No. 198,579

Int. Cl. F41f *1/00*

U.S. Cl. 89—1 R **9 Claims**



A hypervelocity gun range-valve and sabot-trap mechanism consisting of a thin-walled tube having an opening in the range-flight path and communicating with an instrumented test section, and a liquid-filled tube disposed normal to the flight path and surrounding the thin-walled tube for blocking the segments of the segmented sabot portion of a projectile consisting of a combined test model and sabot being fired from the gun tube. On impact of the projectile with the liquid-filled tube, the sabot completes separation from the model and creates a hydrostatic force in the liquid-filled tube that acts against, and collapses and closes a portion of, and therefore the opening in, the thin-walled tube to prevent contaminants from following the model into the test section of the range.

3,724,321

APPARATUS FOR POSITIONING AND SECURING A PROJECTILE HOLDER ON ITS PAD

Pierre Le Cheualier, Residence "Les Violettes" Lotissement des Violettes, 83 Hyers, and Jacques Blangis, 26 rue de Villeneuve, 92 Garches, both of France

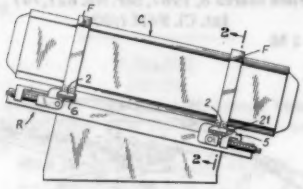
Filed April 21, 1971, Ser. No. 136,067

Int. Cl. F41f *3/04*

U.S. Cl. 89—1.8 **10 Claims**

A projectile holder such as a missile container is positioned and secured on its pad, by guides receiving feet on the con-

tainer and pivotal hooks securing the feet longitudinally on the pad. The guides serve to position the container longitudinally

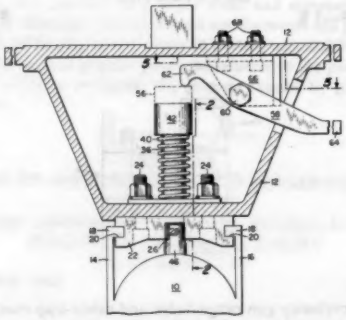


and laterally on the pad. One or more containers can be mounted on a launcher or ramp which may be stationary or adjustable for tracking a target.

3,724,322
RETRACTABLE ELECTRICAL CONNECTOR FOR MISSILES

Richard E. Reed, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 18, 1971, Ser. No. 107,385
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.811 **1 Claim**



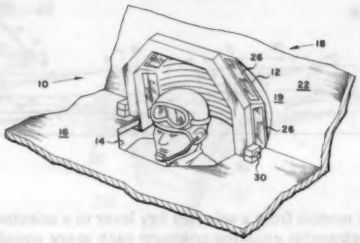
An umbilical connector for missiles, comprising a plug-and-socket assembly of the quick-disconnect type. The plug is carried by the missile, and has prongs which are withdrawn from the socket in the direction of missile movement when the latter is launched. Upon such prong withdrawal, the socket, which is spring-loaded, retracts into the launcher housing, where it is protected from missile exhaust gases. It may be repositioned manually after each operation for use in subsequent launchings.

3,724,323
ROTATABLE HATCH COVER FOR ARMORED VEHICLES

Wolfgang H. Selle, Milpitas, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed March 10, 1971, Ser. No. 122,688
Int. Cl. F41h *5/22*
U.S. Cl. 89—36 L **3 Claims**

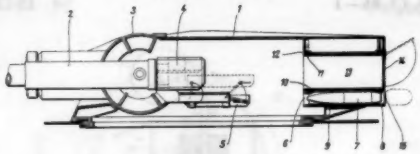
An improved hatch for an armored vehicle wherein an armored collar extending above the armored surface at one side of the hatch opening mates with a rotatable, truncated dome shaped hatch cover to enclose the hatch opening. The hatch cover pivots in a balanced manner down into the hatch opening adjacent to, and inside of, the armored collar to provide an unobstructed hatch opening with improved visibility and protection.



3,724,324
GUN BUILT INTO AN ARMORED TURRET WITH A ROTATING MAGAZINE

Erich Zielinski, Gruiten, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed July 16, 1970, Ser. No. 55,345
Claims priority, application Germany, July 30, 1969, P 19 38 681.3
Int. Cl. F41f *9/06*
U.S. Cl. 89—36 K **7 Claims**



A gun built in an armored turret, particularly of armored vehicles, with a magazine moving in an endless path and comprising tube-like containers for receiving ammunition and disposed parallel relative to each other, which comprises a plurality of containers disposed parallel to the axis of the gun barrel. Means are provided for moving the containers in superposed planes crosswise to the axis of the gun barrel behind the gun. A magazine is arranged and the gun barrel has a loading chamber. The magazine and the loading chamber chamber define a space therebetween, and a loading device is disposed in the space.

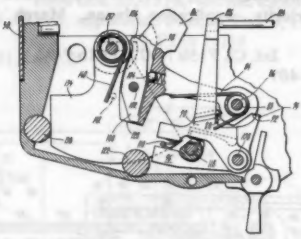
3,724,325
RATE REDUCER

Stanley D. Silsby, Granby, Mass., assignor to Colts Industries Operating Corp., New York, N.Y.

Filed Aug. 24, 1971, Ser. No. 174,334
Int. Cl. F41d *11/02*
U.S. Cl. 89—131 **9 Claims**

An automatic firearm incorporates an integral rate reduction device which delays hammer fall. The rate reduction device is associated with an automatic sear and includes an inertia mass adapted to be pivoted by the hammer during initial

hammer fall. In semiautomatic operation, the inertia mass is not displaced by the hammer when it is pivoted between a



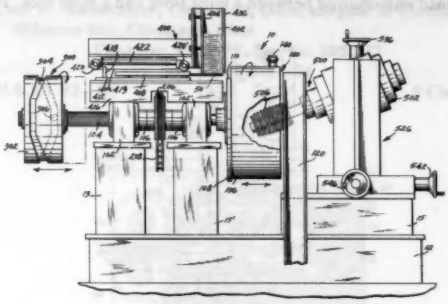
cocked position and the fired position, since all rate reducer action is completed before a shooter pulls the trigger.

3,724,326
SUB-CALIBER CONVERSION UNIT
Robert W. Day, 7515 Stagecoach Lane, San Anthonio, Tex.
Filed July 29, 1971, Ser. No. 167,208
Int. Cl. F41d *11/06*; F41c *21/10*
U.S. Cl. 89—196 **7 Claims**

A sub-caliber conversion unit adapted to be detachably secured to and firmly supported by the lower receiver group of a larger caliber pistol, wherein the slide in such conversion unit operates independently of the barrel, and means are provided to permit full travel of said slide.

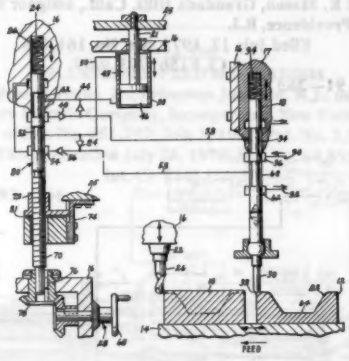
3,724,327
MACHINE FOR GROOVING BRAKE BLOCKS
Carl Edward Gillberg, North Plainfield, N.J., assignor to Johns-Manville Corporation, New York, N.Y.
Filed Aug. 30, 1971, Ser. No. 176,156
Int. Cl. B23c *3/34*
U.S. Cl. 90—11 C **16 Claims**

Machine and method for providing criss-cross grooves in the concave face of precurved brake block forms. A precurved brake block from is located with its radii intersecting along a line to define an axis about which the block is swung and advanced linearly therealong in a direction to define a helical path. While traversing the helical path the concave face of the block passes a set of cutters which score the face thereof with a plurality of parallel grooves disposed at a helical angle with respect to the block. The direction of axial advance is then reversed and the concave face of the block



passes a second set of cutters which score the face thereof with other parallel grooves which cross the first grooves in a criss-cross pattern.

3,724,328
PLATEAU MILLING SCHEME FOR HYDRAULIC TRACERS
Edward W. Yates, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Nov. 4, 1971, Ser. No. 195,676
Int. Cl. B23c *1/16*; B23q *35/18*
U.S. Cl. 90—62 R **5 Claims**

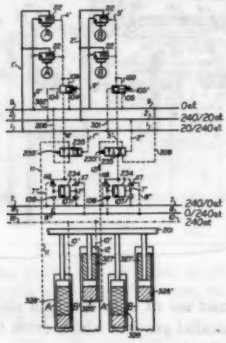


An apparatus for use with an hydraulic tracing system on a machine tool having a slide controlled by the deflection of a tracing stylus wherein there is provided a means for limiting the penetration of a cutting tool into a workpiece. The apparatus comprises means in series with a tracer control valve for shutting off fluid flow to the slide when the cutter has reached a preset penetration level and means for resetting this level.

3,724,329
CONTROL FOR SELF-ADVANCING HYDRAULIC ROOF SUPPORTS FOR LONGWALL FACES IN MINES
Konrad Grebe, Kaiser-Wilhelm-Allee, WuppertalElberfeld, Germany
Filed Sept. 2, 1970, Ser. No. 68,829
Int. Cl. F01l *15/00*; F01b *15/02*
U.S. Cl. 91—189 **5 Claims**

An improvement in a traveling mine roof support wherein hydraulically at least two frames are moved forward in response to hydraulic pressure, said frames being connected

to a piston maintained within a cylinder, said system including means for feeding fluid under pressure into the face side of cylinders holding the frames while one of the frames is maintained immobilized between a mine floor and a mine roof. The



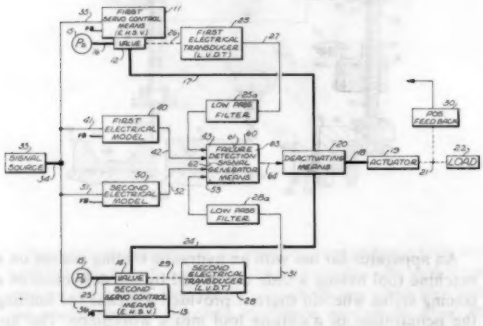
device provides means for advancing the frames, one after the other, while one of the frames is stationary. Check valves are provided to open the hydraulic lines. Valves are also provided in the event the pressure in the system exceeds predetermined values.

3,724,330

SELF MONITORING CONTROL SYSTEM UTILIZING AN ELECTRICAL MODEL FOR EACH CONTROL MEANS

Richard K. Mason, Grandada Hills, Calif., assignor to Textron Inc., Providence, R.I.

Filed July 12, 1971, Ser. No. 161,455
Int. Cl. F15b 9/03, 9/09
U.S. Cl. 91—363 A 7 Claims



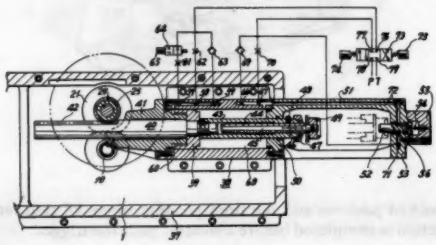
A control system having a plurality of control channels, each of which includes a servo control means having a valve which moves responsively to the application of control signals so as to control the flow of fluid from a source thereof to an output member connected for positioning a load. Electrical transducer means is connected to the control valve to produce an electrical signal which is characteristic of the servo control means. An electrical model which produces an output electrical signal which is characteristic of that signal desired for the servo control valve is provided. The output electrical signals are connected to a comparator for detecting disparity between the signals thus generated and then for providing an output signal which deactivates the particular servo control means wherein the failure has occurred which causes the disparity in the signals being compared.

3,724,331

FEED MECHANISM FOR MACHINE TOOL

Akiyoshi Kobayashi, Kariya-shi, Aichi-ken, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed March 11, 1971, Ser. No. 123,212
Claims priority, application Japan, March 13, 1970, 45/24103
Int. Cl. F15b 15/22; F01b 9/02
U.S. Cl. 91—407 9 Claims



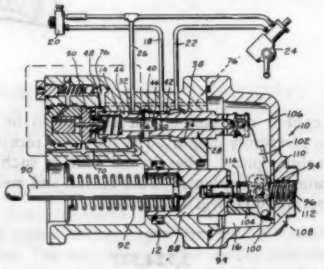
A feed mechanism for a machine tool with a feed table is provided with a hydraulic cylinder for moving the feed table to perform a machining operation. In the cylinder a screw shaft is adjustably threaded into the rod of the piston thereof for adjusting the stroke length of the piston. The free end of the screw shaft is adapted to be brought into engagement with a resiliently urged stop member to control the exhausting of fluid from the cylinder so that the speed of the piston is reduced just before the piston is fully stopped.

3,724,332

PRESSURE LIMITER FOR HYDRAULIC BOOSTER

Lloyd Gene Bach, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Feb. 10, 1972, Ser. No. 225,060
Int. Cl. F15b 7/00, 13/10, 13/14
U.S. Cl. 91—391 R 9 Claims



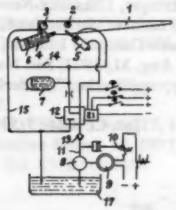
A pressure limiting device for a hydraulic brake booster is disclosed which limits the fluid pressure level in the pressure chamber of the booster to a predetermined maximum level. The pressure limiter includes a differential pressure responsive piston which shifts into engagement with the end of the spool valve used to control communication between the booster pressure chamber and a pressure source when the pressure level in the pressure chamber attains the predetermined maximum value. After the piston engages the end of the spool valve, the latter may not be shifted further from the brake release position to admit higher fluid pressures into the pressure chamber.

3,724,333

OPERATING SYSTEM FOR AIRCRAFT BARRIER NETS

Per Borje Fonden, and Karl Ove Torgny Walander, both of Linkoping, Sweden, assignors to Borgs Fabriks AB, Norrkoping, Sweden

Filed Oct. 23, 1970, Ser. No. 83,439
Claims priority, application Sweden, Dec. 4, 1969, 16740
Int. Cl. F15b *11/16*
U.S. Cl. 91—411 R 4 Claims



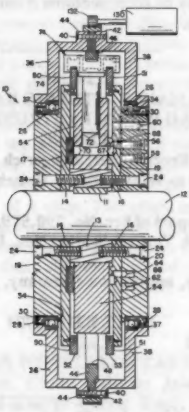
Device for operating an aircraft arresting mechanism in which the barrier supporting standard is raised and lowered with respect to the runway by two servomotors, one being larger than the other, the larger one producing the smallest moment and the smaller servomotor producing the largest moment when the standard rests in the lowered position, the moments being so balanced as to exert a downward torque on moments being so balanced as to exert a downward torque on the standard in the lowered position, control means being provided to convert the moments so as to produce a first stage gradual raising operation and a rapid second stage raising operation.

3,724,334

MECHANICAL DRIVING

James M. Denker, Scituate, Mass., assignor to Nutron Corporation, Hingham, Mass.

Continuation-in-part of Ser. No. 843,545, July 22, 1969, Pat. No. 3,584,542. This application June 11, 1971, Ser. No. 152,253
Int. Cl. F01b *13/06*, *15/00*
U.S. Cl. 91—491 26 Claims



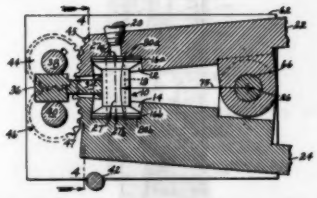
A fluid device including, in a first aspect, a fixed member defining a first cam surface having *m* cycles, a movable member defining a second cam surface having *n* cycles, and a movable piston support carrying fewer than the greater of *m* and *n* pistons each of which is mounted for movement relative to the piston support and engages the cam surface; and, including in a second aspect, a hydrostatic piston assembly mounted on a piston support for movement relative thereto in engagement with at least two cam surfaces.

3,724,335

HYDRAULIC ACTUATOR WITH ARCUATE EXPANSIBLE CHAMBERS

Carl W. Kaesemeyer, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 15, 1971, Ser. No. 208,133
Int. Cl. F01b *15/04*
U.S. Cl. 92—66 5 Claims



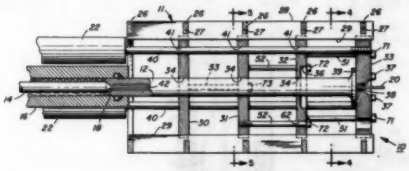
A fluid driving apparatus is contained in one of the ends of two lever arms designed to pivot about a common fulcrum point. The driving apparatus comprises a piston limited to move in a direction perpendicular to its axis, an arcuate expansible chamber in each of the lever arms, wherein each chamber is designed to receive one end of the piston, means for providing fluidic communication between the chambers and means for supplying fluid under pressure to the chambers thereby expanding said chambers and applying a force to the lever arms.

3,724,336

COLLAPSIBLE FEED MECHANISM

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 651,292, July 5, 1967, Pat. No. 3,548,625. This application July 28, 1970, Ser. No. 64,892
Int. Cl. F16j *15/18*
U.S. Cl. 92—166 25 Claims



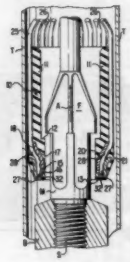
This disclosure is directed to a collapsible feed mechanism for advancing and retracting a rod or rod-like member, and in particular a "slender column," which may be subjected to large compressive axial loads. The collapsible feed mechanism disclosed herein comprises a plurality of aligning plates and a drive plate all slidably mounted within a support cage. Power cylinders, connected to the drive plate by piston rods, advance and retract the rod, or slender column, which is also connected to the drive plate. The aligning plates and drive plate cooperate to centrally position, advance and retract the rod or slender column, e.g., an extrusion die ram, without bending or buckling the column, even when subjected to large compressive axial loads, e.g., the force of extrusion necessary to advance the die ram upwardly of a billet confined in a high pressure vessel, to extrude the billet into wire.

3,724,337

EXPANDED-RING SWAB CUP CAGE

Murl R. Richardson, Fort Worth, Tex., assignor to Oil States Rubber Company, Arlington, Tex.

Filed May 18, 1971, Ser. No. 144,441
Int. Cl. F16j 1/00; F04b 21/04
U.S. Cl. 92—241 5 Claims



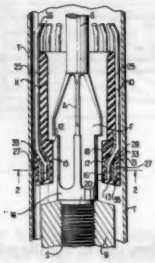
A reinforcement cage, and method of making, useful in well swab cups of the type having an annular body of elastomeric material with an axial bore extending therethrough, the cage including a series of axially disposed annularly-spaced wire members held at their lower ends between an outer ring of dimensionally stable hardened metal and an inner ring of softer metal which is initially inserted within the wire members and subsequently radially expanded to confine them tightly between the rings which form the base of the cup. The outer ring has an inwardly extending flange covering the lower ends of the wires and the inner ring, and the inner ring has an upwardly extending portion terminating above a flex zone of the wires and above the level of the outer ring to help prevent slumping of the elastomeric body downwardly and outwardly between the wire members.

3,724,338

SWAB CUP CAGE

Murl R. Richardson, Fort Worth, Tex., assignor to Oil States Rubber Company, Arlington, Tex.

Filed April 30, 1971, Ser. No. 139,039
Int. Cl. F16j 1/00; F04b 21/04
U.S. Cl. 92—241 5 Claims



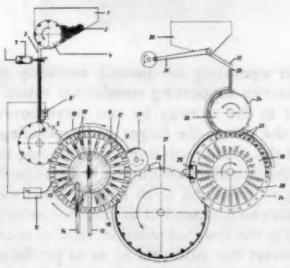
An oil well swab cup cage structure in which the lower ends of reinforcement wire members lie against an inner annular base ring, are surrounded by a soft metal intermediate ring displaced inwardly and shaped to lie around and between the lower ends of the wire members ad further surrounded by a hard dimensionally-stable outer ring pressed over the intermediate ring to flow the metal of the latter into tighter engagement about said lower ends to hold them against displacement with respect to said inner base ring. The invention also discloses a method of making a swab cup cage structure including the steps of initially holding the wires in annular parallel orientation, inserting an inner base ring within them, surrounding them in the vicinity of the base ring with a soft-metal intermediate ring, displacing the latter inwardly around and between the wire members, and pressing a hard ring having an interfering internal diameter over the intermediate ring to further contract it on the wire members.

3,724,339

MACHINE FOR INSERTING FILTERS INTO TIP-HOLDERS FOR SMOKERS ARTICLES

Adrifn Louis Metzinger, Cheseaux-Noreaz, and Charles Raillard, Yverdon, both of Switzerland, assignors to British-American Tobacco Company Limited, London, England

Filed Aug. 31, 1971, Ser. No. 176,574
Claims priority, application Switzerland, Sept. 14, 1970, 13614/70
Int. Cl. A24c 5/52
U.S. Cl. 93—1 C 9 Claims



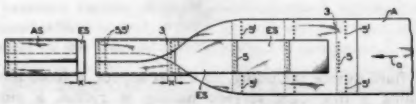
Elongated filter sections are fed from a feed channel to a transfer drum which transfers them to peripheral compartments on a receiving cylinder where they are pushed against a stop by pneumatic means acting in a first zone upstream of means for cutting off filter tips. Transfer means deliver the filter tips to a drum comprising pusher means for inserting the filter tips in tip holders, and the remainders of the sections are pushed against the stop by the pneumatic means acting in a second zone. Means for sensing the absence of filter sections in said compartments actuate electromagnetic means for controlling the supply of filter sections from the feed channel to the transfer drum.

3,724,340

PROCESS FOR MANUFACTURING BAGS COMPRISING A LINER BAG WHICH PROTRUDES FROM THE OPENING

Friedrich Franz Brockmuller, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Continuation-in-part of Ser. No. 790,579, Jan. 13, 1969, Pat. No. 3,576,154. This application Nov. 17, 1970, Ser. No. 90,333
Claims priority, application Germany, Jan. 13, 1968, P 19 11 710.5
Int. Cl. B31b 49/04
U.S. Cl. 93—35 R 11 Claims



A method of manufacturing bags consisting of at least a single ply outside bag and a liner bag which extends at the filling end out of the outside bag. A web of material for the outside bag is divided by transverse perforations into specific outside bag lengths still attached to each other and pieces correspond-

ing to the length of the inner bag are cutoff from a web of liner bag material. The individual liner bag pieces are placed in a sequence on the web of the outside bag material and the web of the outside bag material is wrapped around pieces of the inner bag in a tube shape. The transverse perforations are then torn into lengths of tube and the lengths of tube are fed into a bottom closing machine.

3,724,341

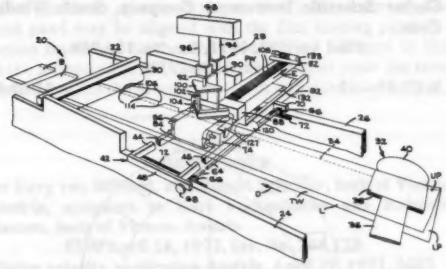
METHOD AND APPARATUS FOR MAKING SQUARE BOTTOM BAGS FROM THERMOPLASTIC WEB MATERIAL

Corey T. Hook, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 779,453, Nov. 27, 1968, Pat. No. 3,575,090. This application March 10, 1971, Ser. No. 123,102

Int. Cl. B31b *1/88*

U.S. Cl. 93—35 R **2 Claims**



A folded web of thermoplastic material, such as polyethylene, is fed to a bag making machine set up to produce side weld bags. The folded edge of the web encounters a gusseting attachment which forms a reverse fold at this edge. Downstream of the gusseting attachment an apparatus is provided for removing a generally triangular web portion from the gusseted margin of the web by a heated cutting and sealing bar having a configuration corresponding to the removed web portion. During removal of a web portion, hereinafter sometimes referred to as a slug or a chip, areas coming in contact with the cutting and sealing bar are rendered molten. Immediately after removal, the chip is brought in firm contact with a paper web which is located immediately below the thermoplastic web and the molten edges of the chip become attached to the paper web. During each cycle of the bag machine the paper web is indexed to present an additional area for reception of a chip. The chips are attached to the paper web in shingled or overlapping relation. The web portion carrying the waste slugs or chips is fed to any suitable waste receptacle that may be located adjacent the bag machine.

3,724,342

COMPACTION WHEELS FOR EARTH TAMPERS

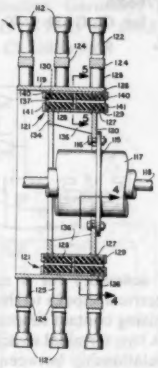
Fred Joseph Caron, Citrus Heights; James Oliver Caron, Sacramento, and George Carrel Gray, Fair Oaks, all of Calif., assignors to Caron Compactor Co., West Sacramento, Calif.

Continuation-in-part of Ser. No. 63,122, Aug. 12, 1970. This application March 10, 1971, Ser. No. 122,746

Int. Cl. E01c *19/26*

U.S. Cl. 94—50 PR **4 Claims**

Compaction wheels for earth tampers. In one embodiment the compaction wheels are of spaced, open ring, spoked construction with sheepsfoot elements projecting outwardly from each ring. The rings have an axial width merging with the width of the spokes and the wheel is constructed and arranged to afford substantially unobstructed full penetration for compaction, with means being provided to cushion the wheel axle from shock loads. In another embodiment the compaction wheels are provided with axle cushioning means which include a plurality of circumferentially arranged, axially disposed



shock absorber units each having facing socket members defining a cavity for seating a pair of elastomer cushioning cylinders. The cylinders are formed with axially extending central openings to accommodate expansion of the elastomer material under shock loading.

3,724,343

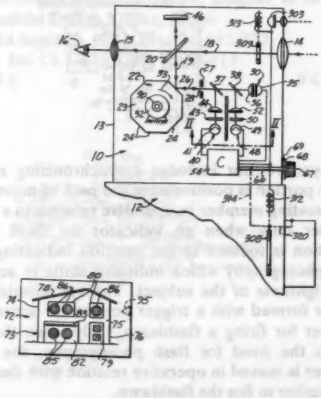
ANALYTICAL PHOTOGRAPHIC EXPOSURE METER

Joseph H. Lancor, Jr., deceased, late of Arcadia, Calif. (by Ellen B. Lancor, administratrix), and Dexter P. Cooper, Jr., Pasadena, Calif., assignors to Bell & Howell Company, Chicago, Ill., by said Ellen B. Lancor, administratrix

Filed Aug. 23, 1971, Ser. No. 173,761

Int. Cl. G01j *1/42*

U.S. Cl. 95—10 R **18 Claims**



A photographic exposure meter provides a visually observable optical image of a scene and analyses the scene for predetermined light intensities. The exposure meter then provides, within the usually observable image, visually observable indications of presence and location of predetermined light intensities in the scene. An optical scanning device may be employed for aiding in the determination of predetermined light intensities and in the provision of the visually observable indications.

3,724,344

CAMERA FLASHGUN SHOE

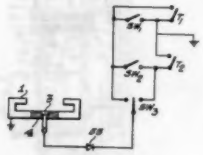
Tetsuji Shono, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 2, 1971, Ser. No. 167,989

Claims priority, application Japan, Aug. 3, 1970, 45/76685; Aug. 3, 1970, 45/76686

Int. Cl. G03b *9/70, 15/02*

U.S. Cl. 95—11 L **3 Claims**



A "hot shoe" accessory for a camera provides for the elimination of electrical shocks to the user. The accessory includes a synchronizing contact supported adjacent to an aperture in the shoe. A two-terminal switching device is connected in series circuit relationship between the synchronizing contact and a terminal of the conventional female PC connectors provided as a standard feature on the camera body. The two-terminal switching device is a unilaterally conductive circuit element which blocks current transmission from the PC connector to the shoe and thereby prevents electrical shocks to the user but which conducts current in the opposite direction during flash operation.

3,724,345

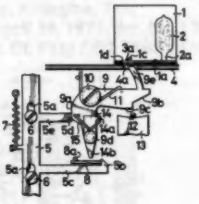
SYNCHRONIZER IN CAMERA

Keiji Yamazaki, Izumi, Osaka Prefecture, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 8, 1971, Ser. No. 160,637

Int. Cl. G03b *15/04*

U.S. Cl. 95—11.5 R **4 Claims**



A synchronizer includes a synchronizing member whose driven portion is positioned in the path of movement of a sector actuating member in operative relation to a shutter release member only when an indicator for flash photographing operation is located at the position indicating the need for flash photography which indicator shifts in accordance with the brightness of the subject. The synchronizing member is further formed with a trigger portion for actuating a striking member for firing a flashlamp. Only when the indicator indicates the need for flash photography, the synchronizing member is moved in operative relation with the sector actuating member to fire the flashlamp.

3,724,346

REFLECTOR EXTENSION FOR LAMP UNIT

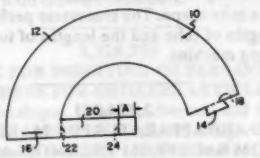
Donald E. Armstrong, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Sept. 22, 1971, Ser. No. 182,625

Int. Cl. G03b *15/02*; F21v *7/18*

U.S. Cl. 95—11 L **2 Claims**

A disposable reflector extension for a flashcube comprising a sheet of reflective material having an arcuate portion adapted for forming a funnel-shaped reflector and a strip portion adapted for shaping a mounting hook to hold the funnel-shaped reflector onto the face of a flashcube.



3,724,347

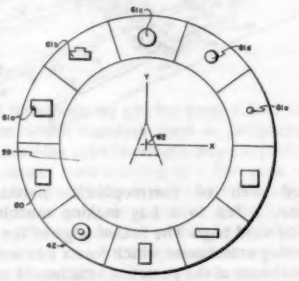
APPARATUS FOR SELECTIVELY EXPOSING A PHOTOSENSITIVE SURFACE

Heinz Joseph Gerber, West Hartford, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed April 23, 1971, Ser. No. 136,909

Int. Cl. G03b *29/00*

U.S. Cl. 95—12 **11 Claims**



A method and apparatus for selectively exposing the photosensitive surface of an article employs a cathode ray tube to generate radiant images which are projected onto the photosensitive surface. The cathode ray tube is connected to a computer which controls the deflection of its beam to generate the images, and the tube and the associated optical system are mounted on a carriage movable relative to the photosensitive surface to enable exposure of different regions of the photosensitive surface and the exposure of lines on the photosensitive surface by moving a projected spot of light. The radiant images are produced both by drawing images on the display screen with the beam and by causing the beam to substantially continuously energize different selected areas of the screen to illuminate predefined images, the shapes of which are determined by masks or similar means, each one of such selected areas having one of the predefined images associated with it.

3,724,348

MEANS FOR PREVENTING FILM MOVEMENT IN A CAMERA

David E. Monks, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

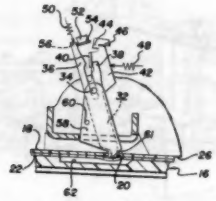
Filed April 12, 1972, Ser. No. 243,361

Int. Cl. G03b *19/04, 1/42*

U.S. Cl. 95—31 R **6 Claims**

A camera includes a transport mechanism for advancing perforated film along an exposure plane. A film sensing pawl is movable between a retracted position on one side of and spaced from the exposure plane and a position transversing the exposure plane through a film perforation to disable the

transport mechanism when the perforation reaches a predetermined position. The sensing pawl may be held in its retracted position when the film is not being advanced. A second pawl which is fixed in the housing on one side of and transversing the exposure plane enters a film perforation after



the film has been advanced to prevent film movement. The second pawl may be aligned with the film sensing pawl in a direction transverse to the direction of film advance so that both the second pawl and the film sensing pawl enter the same perforation when the sensing pawl is in its extended position.

3,724,349

VIEWFINDER

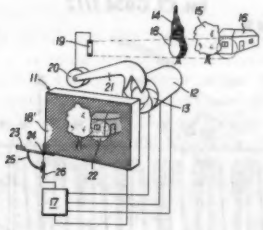
Peter Revy von Belvard, and Robert Scheiber, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hausen, both of Vienna, Austria

Filed April 14, 1972, Ser. No. 244,178

Claims priority, application Austria, April 29, 1971, 3683

Int. Cl. G03b *3/08*; H01j *31/50*

U.S. Cl. 95—44 R **21 Claims**



In an optical system an objective defining an optical axis and at least one image plane, the objective forming a real image of an object in the image plane. A device is provided for varying the contrasts of said image. The means is arranged on the optical axis and comprises a plurality of photoelectric receivers arranged in at least one plane within the range of the image plane. The photoelectric receivers have a nonlinear characteristic and have an output, the value of which varies in dependence on the sharpness of the real image in the plane of the photoelectric receivers, the value assuming an extreme with coincidence of the image plane and the plane of the photoelectric receivers. A layer of a plurality of electrooptic transducers is provided, each of the transducers being connectable with a corresponding receiver. Each of the transducers is associated to the other transducers in the same configuration as the corresponding receiver with respect to the other receivers to form an image corresponding to the real image, but having contrasts varied in dependence on the depth of field of the objective.

3,724,350

ELECTROMAGNETIC DRIVE FOR PHOTOGRAPHIC SHUTTERS

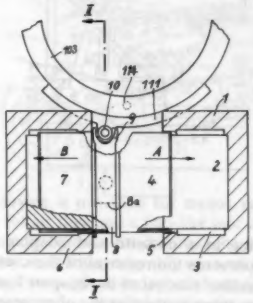
Bodo Mielke, 3300 Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Division of Ser. No. 88,849, Nov. 12, 1970. This application June 22, 1971, Ser. No. 155,415

Claims priority, application Germany, June 26, 1970, P 20 31 565.5; Apr. 22, 1971, P 21 19 609.8

Int. Cl. G03b *9/08*

U.S. Cl. 95—53 E **14 Claims**



An electromagnetic drive for the blades of a photographic shutter, using at least one pot-shaped magnet in fixed position. A cylindrical coil, when properly energized, moves into or out of the pot-shaped magnet. The coil is connected directly to a movable shutter blade in one embodiment, or to a blade operating member (such as a rotatable ring) in another embodiment. To obtain faster exposures, the moving parts engage a resilient stop when the shutter reaches fully open position, and this resilient stop absorbs some of the kinetic energy of the opening movement and gives it back to the moving parts in a closing direction.

3,724,351

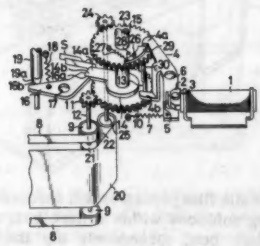
DEVICE FOR MOUNTING ELECTROMAGNETICALLY ATTRACTABLE PIECE FOR LATCHING ELECTRONIC SHUTTER IN CAMERA

Toshiaki Matsumoto, Amagasaki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 23, 1971, Ser. No. 182,972

Int. Cl. G03b *9/08*; H01f *7/14*

U.S. Cl. 95—53 E **8 Claims**

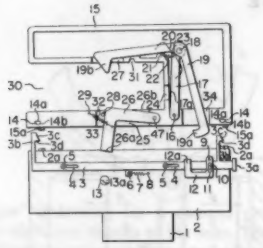


An electromagnetically attractable piece having a face to be attracted to an electromagnet is rotatably mounted on a pivot on a shutter latch member, and a restricting member for limiting the rotation of the attraction member is disposed in the rear of the attractable piece, whereby the change in position of the attractable piece with respect to the electromagnet when it is released therefrom is restricted to eliminate detrimental effects on the shutter speed.

3,724,352
SAFETY DEVICE FOR A CASSETTE AND ADAPTER ASSEMBLY FOR CAMERAS

Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed June 7, 1971, Ser. No. 150,631
Claims priority, application Japan, June 12, 1970, 45/57522
Int. Cl. G03b 17/26
U.S. Cl. 95—71 8 Claims

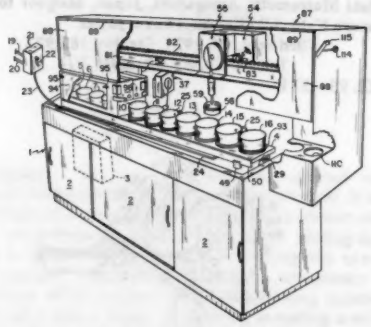


A safety device in a cassette and adapter assembly for cameras which prevents the removal of the cassette from the adapter as well as the removal of the adapter from the camera body after a draw cover protecting the photosensitive material in the cassette is withdrawn from the cassette. The safety device prevents the cassette from being mounted in the adapter unless the draw cover of the cassette is in position. Additionally, the shutter button of the camera cannot be actuated when the cassette is installed unless the draw cover has been removed. The adapter can be mounted on the camera body when the cassette is not loaded in the adapter.

3,724,353
AUTOMATIC LINE TRAVERSE AND DIP FILM PROCESSOR

Harry C. Holbert, 83 Mount Lebanon Drive, Wheeling, W. Va.

Filed Oct. 30, 1970, Ser. No. 85,407
Int. Cl. G03d 3/00, 3/04
U.S. Cl. 95—89 D 14 Claims

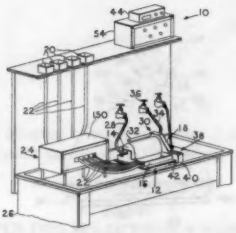


The automatic film processor will successively dip the film in processing solutions within a dark box, remove the film from the dark box, successively dip the film in further processing solutions, and finally dry the developed film. The processing solutions are held in individual containers carried in and projecting through a pivotal rack, which rack is selectively vibrated at relatively high frequency and rocked at a relatively low frequency, according to a program. The lower ends of the solution containers project into a water bath maintained at a desired temperature, with the water bath being fed by a piping system passing incoming water into the wash containers with overflow into a dump trough separate from the water bath.

3,724,354
PHOTOGRAPHIC PROCESSING APPARATUS

James McC. Smith, 6 B St., Adams, Mass.

Continuation of Ser. No. 883,797, Dec. 10, 1969, abandoned.
This application Nov. 18, 1971, Ser. No. 200,256
Int. Cl. G03d 3/06
U.S. Cl. 95—93 10 Claims

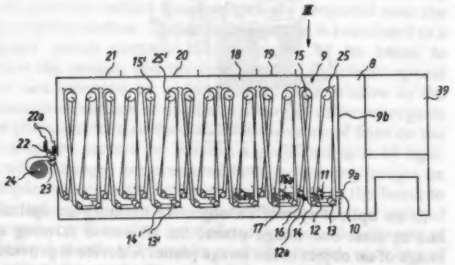


The automatic photo processing apparatus employs a tape control unit in combination with a chemical dispenser, a wash unit and an applicator unit for application of chemicals and wash water to a photographic print in a programmed sequence. The chemical dispenser is adapted to sequentially dispense a plurality of chemicals, and the tape control unit is configured to produce signals on two channels to control the other three units in accordance with a predetermined process.

3,724,355
APPARATUS FOR PROCESSING EXPOSED PHOTOGRAPHIC FILM OR THE LIKE

Josef Busch, Eichendorffstr. 11, Bensberg; Herbert Bruck, Havelstr. 3, Leverkusen; Karl-Wilhelm Schranz, Bruchhauserstr. 16b, Opladen; Erwin Schon, Donhoffstr. 92, Leverkusen, and Hans-Dieter Frick, Bozener Str. 7, Munich, all of Germany

Filed June 11, 1971, Ser. No. 152,269
Claims priority, application Germany, June 12, 1970, P 20 29 044.2
Int. Cl. G03d 3/12
U.S. Cl. 95—94 R 18 Claims

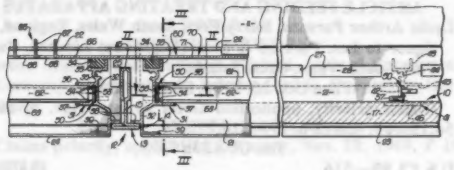


A system of guide rollers for transporting exposed photographic film past one or more stations where the exposed surface of the film is coated with a viscous adhesive has a set of upper guide rollers and a set of lower guide rollers. The film is caused to travel along an elongated winding path which has vertical sections each extending between an upper guide roller and a lower guide roller, and at least one guide roller of each pair of successive guide rollers has a convex peripheral surface. The central line of each vertical section of the winding path coincides with tangents to the central portions of peripheral surfaces on the respective upper and lower guide rollers. The planes which are normal to the axes of pairs of successive guide rollers make an angle which exceeds zero degrees but is less than 91°.

3,724,356
FIRE RESISTANT AIR BAR FOR USE IN A SUSPENDED CEILING STRUCTURE

Robert R. Lambert, Glendora, Calif., assignor to Air Factors, Inc., Covina, Calif.

Filed Nov. 15, 1971, Ser. No. 198,692
Int. Cl. F24f *13/06*
U.S. Cl. 98—40 D 9 Claims

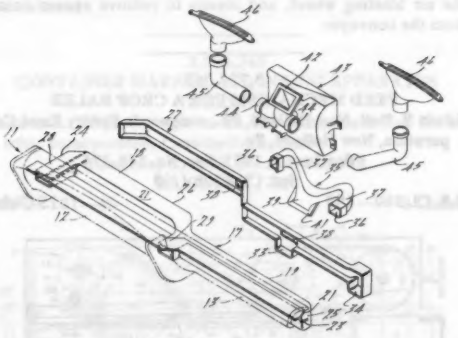


The fire resistant air bar has high temperature resistant side rails for supporting the fire resistant ceiling tiles of a suspended ceiling, and for supporting an air plenum chamber; has high temperature resistant spacer bars located between the side rails with end tabs thereof extending through slots in the side rails to fasten thereto; has lower temperature melting spacers mounted on the spacer bars between the side rails; and has nested weir channel members located between the spacers, whereby when the spacers weaken or melt due to high temperature of a fire, the spacer bars maintain the spacing of the side rails to continue supporting the ceiling tiles for blocking the passage of the fire through the suspended ceiling.

3,724,357
INTEGRATED AIR DISTRIBUTION SYSTEM

Keshav S. Kavthekar, Melvindale, and Jess J. Somers, Redford Township, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 8, 1971, Ser. No. 205,825
Int. Cl. B60i
U.S. Cl. 98—2.11 12 Claims

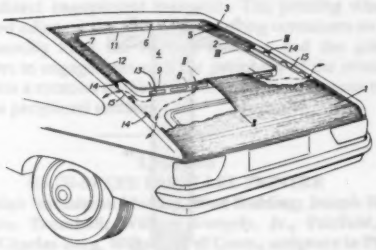


An air distribution system integrated into a molded plastic instrument panel for a vehicle body, the instrument panel being capped by a crash pad. The air distribution system comprises a duct integrally molded into the instrument panel and sharing walls in common therewith. The duct is encompassed across its frontal and upper surfaces by the crash pad with an insulating air gap therebetween. The duct is substantially open on its rear side and the open surface is fitted with a molded plastic cover plate to form the complete duct. Spaced openings in the face of the instrument panel provide for air distribution from the duct to the vehicle body interior. A "V"-shaped piece having indirect line of sight from its inlet to its outlets connects the integral duct to the plenum chamber of a vehicle heating and cooling unit.

3,724,358
AIRING DEVICE FOR MOTOR VEHICLES

Willi Lang, Ingolstadt, and Manfred Sprenger, Lenting, both of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Ingolstadt, Germany

Filed May 19, 1970, Ser. No. 38,712
Int. Cl. B60h *1/24*
U.S. Cl. 98—2.18 7 Claims

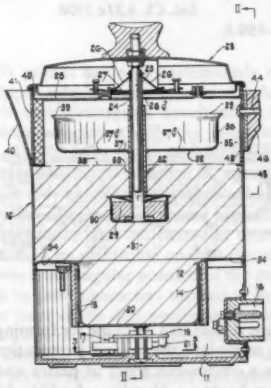


An airing device is provided for motor vehicles having a body suitable for air flow and a flap-like rear door. The invention is particularly characterized in that the inner part of this door is provided with slits preferably upon all four frame walls which limit the door surface and which form the frame beams. Frame beams extending parallel to the direction of the drive have walls with slits which open into a space connected with the door joint between the door frame and the door post.

3,724,359
BEVERAGE MAKER

Leonard Kenneth Morgan Masters, Newcastle-under-Lyme, and Thomas Dalziel, Birmingham, both of England, assignors to Russell Hobbs Limited, Alperton, England

Filed May 3, 1971, Ser. No. 139,380
Claims priority, application Great Britain, May 6, 1970, 21,752/70
Int. Cl. A47j *31/00*
U.S. Cl. 99—281 6 Claims

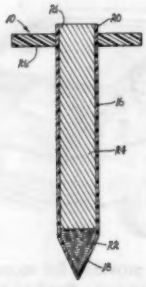


In a beverage-maker including a vessel in which a liquid is heated, and a receptacle for a material to be infused in the liquid, the receptacle is mounted for movement in the vessel between an upper position such that contact between the contents of the receptacle and the liquid is prevented and a lower position in which such contact can take place. Means is provided for holding the receptacle in its upper position until the liquid reaches a predetermined temperature and the receptacle is then released to float on the surface of the liquid. Apertures in the bottom of the receptacle then admit liquid at a controlled rate such as to avoid the production of foam to an unacceptable degree by interaction between the liquid and the material in the receptacle.

3,724,360
THERMAL INDICATOR

George G. Kliewer; Steven L. Kliewer, and Michael G. Kliewer, all of Fresno, Calif., assignors to Dun-Rite Manufacturing Corporation, Fresno, Calif.

Filed Feb. 25, 1971, Ser. No. 118,910
Int. Cl. A47j *37/00*; G01k *13/00*
U.S. Cl. 99—342 10 Claims

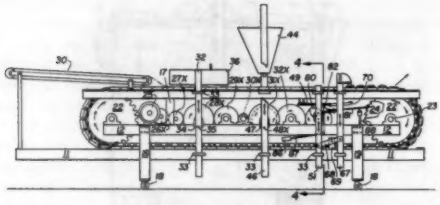


A thermal indicator particularly suited for use in indicating temperatures attained by a heated body such as an article of food subjected to cooking temperatures elevated above room temperature. The invention is characterized by a tubular body including a closed end containing a fluid having a predetermined boiling point and an opened end filled with a sealant having a melting point well above room temperature, but substantially below the boiling point of the fluid so that as the boiling point is attained, the fluid is volatilized and the sealant is expelled from the tube and deposited externally of the opened end.

3,724,361
PASTRY MAKING MACHINE

Leonard Schafer, 2770 Briggs Avenue, New York, N.Y.

Filed June 10, 1971, Ser. No. 151,835
Int. Cl. A21c *3/06*
U.S. Cl. 99—450.6 6 Claims

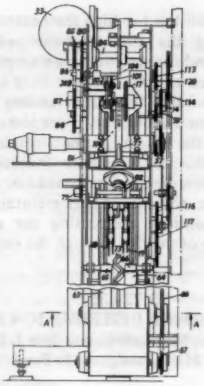


This machine relates to a machine for forming edible folded danish pastry to replace the manual preparation thereof. The machine uses a continuous sheet of pastry and first molds a transverse row having a plurality of edible filling receiving pockets; next the pockets are cut into blanks; then edible filling is deposited onto the blanks; then the corners of the blanks are consecutively folded over one another according to predetermined configuration and lastly the folded pastry is lifted up for removal from the machine. The plurality of operating stations are each cam operated from a chain of precalculated gear diameters to effect a timed vertical up and down reciprocity for intermittent operation. The machine comprises a chain conveyor having a plurality of substantially identical transverse slats. Each slat is adapted to receive a removable multi-celled cage. Moreover, each slat is provided with a plurality of different diameter apertures. Some of the apertures are adapted to receive machine operated push rods to effect reciprocal engagement with spring-loaded folder elements disposed above the slat. Other slat apertures are oriented to receive frictionally the prongs of the removable folder units and also the prongs of the separately removable lifter units. Therefore, the pastry contacting units and cage are removable from the machine of this invention, so that they may be sterilized.

3,724,362
ARTICLE FEEDING AND TREATING APPARATUS

Leslie Arthur Parsons, Burry Port, South Wales, England, assignor to Les. Parsons & Sons (Engineers) Limited, Burry Port, South Wales, Great Britain

Filed Oct. 26, 1970, Ser. No. 83,812
Claims priority, application Great Britain, Nov. 5, 1969, 54,150/69; March 6, 1970, 10,772/70
Int. Cl. A23n *7/00*
U.S. Cl. 99—516 11 Claims

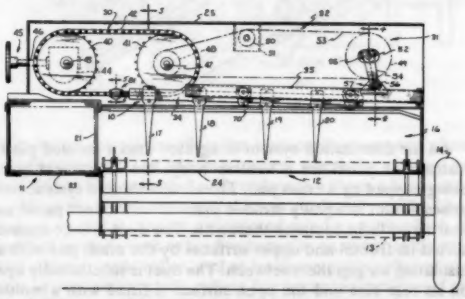


An onion skinning machine comprising a wheel or like having onion air-blasting chambers, a hopper to contain onions, endless conveyor means to convey onions from the hopper to the air blasting wheel, and means to remove excess onions from the conveyor.

3,724,363
FEED MECHANISM FOR A CROP BALER

Edwin B. Nolt, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed June 1, 1971, Ser. No. 148,374
Int. Cl. B30b *1/00*
U.S. Cl. 100—189 15 Claims



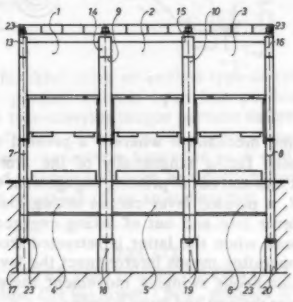
A feeding mechanism that sweeps crops along a feed chamber into a bale case of the baler is of the double bar type with a straight tubular feed finger supporting member and a guide member in reciprocal supporting relation thereto. Rollers on the sides of the supporting member are in constant longitudinal spaced relation and ride in transversely spaced U-

shaped tracks on opposite sides of the guide member. The supporting member is connected to an elliptical chain drive located in a drive housing above the feed chamber at the bale case end. The guide member is connected to a rotating crank at the opposite end of the drive housing. The drives actuate the members to move the feed fingers along the feed chamber in a feed stroke for sweeping crops into the bale case and return the feed fingers through the drive housing in a generally parallel relation to the feed chamber.

3,724,364
PRESS FRAMEWORK

Werner Munch, and Wolfgang Michael, both of Goppingen, Germany, assignors to L. Schuler GmbH, Goppingen, Germany

Filed Nov. 17, 1970, Ser. No. 90,400
Claims priority, application Germany, Nov. 19, 1969, P 19 58 051.9
Int. Cl. B03b *1/00*
U.S. Cl. 100—214 **22 Claims**

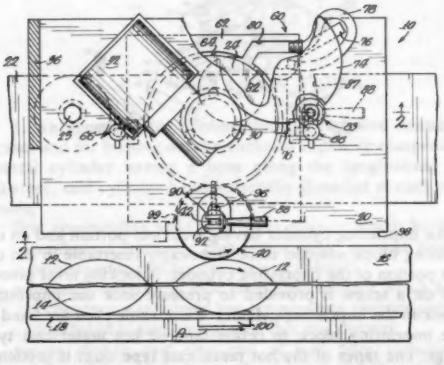


A press framework consisting of a top section, a table section and frames receiving the ends of these sections. The frames are formed of hollow columns, bridgepieces contacting the ends of the columns and stays passing through the hollow columns and bracing the bridgepieces with respect to the hollow columns.

3,724,365
CONTAINER MARKER AND INKING APPARATUS THEREFOR

Sheldon L. Wilde, Crawfordsville, Ind., assignor to H-C Industries, Incorporated, Crawfordville, Ind.

Filed May 5, 1971, Ser. No. 140,388
Int. Cl. B41f *17/20*
U.S. Cl. 101—40 **8 Claims**

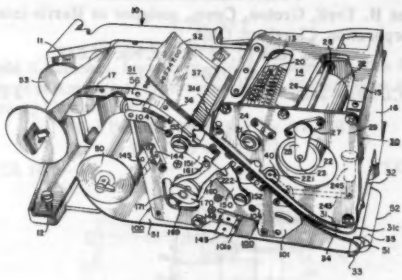


Marking apparatus for printing indicia on the peripheral surface of an advancing procession of containers including a printing element consisting of a shaft having first and second axially spaced portions supported thereon. The first portion supports a friction member while the second portion supports a plurality of circumferentially spaced marking characters. The marking apparatus also includes a driven wheel that has a first friction portion arranged to frictionally drive the printing element or wheel in response to rotation of the drive wheel. The drive wheel further includes a second portion that has ink delivered thereto which is transferred to the marking characters by direct engagement therewith. The printing wheel is positioned adjacent the path of the moving containers so as to simultaneously have the friction member and the printing characters in engagement with the periphery of the container to produce a rotation of the container and simultaneous marking of the peripheral surface.

3,724,366
HIGH-SPEED PARALLEL PRINTER

Nanjundiah Narasimha Murthy, West Redding; Joseph Steven Macura, Trumbull; William Gergely, Jr., Fairfield, and Allen Charles Berg, Wilton, all of Conn., assignors to Pitney-Bowes-Alpex, Inc., Danbury, Conn.

Filed Dec. 13, 1971, Ser. No. 207,114
Int. Cl. B41j *41/46*
U.S. Cl. 101—93 C **33 Claims**



An on-the-fly printer having a continuously rotating drum including multiple side-by-side columns of characters, and having multiple spring-energized acceleration and print impact mechanisms associated with the respective character columns, the acceleration and impact mechanism being mechanically restored to, and latched in, energy-stored positions from which they can be selectively released each to drive a separate hammer against paper and/or paper forms inserted between the mechanism and the character drum, the release being accomplished by electronic control circuitry operative to determine when the angular position of the drum is correct and thereupon to print characters located in that row of the drum in one or more of the digit positions corresponding with the various columns of print, the electronic control circuitry subsequently enabling a restore mechanism to retract and latch all of the acceleration and impact mechanisms as soon as a row or line of digit positions has been printed, the printer automatically advancing paper tapes as well as manually inserted forms to the next print position during each operation of the restore mechanism.

3,724,367
PRINT DRUM CLAMP

Arthur M. Pasinski, Howell, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 1, 1970, Ser. No. 77,288
Int. Cl. B41j *1/60*; B21b *13/02*
U.S. Cl. 101—110 **7 Claims**

A clamp of one-piece construction for mounting a print

drum to a rotatable shaft of a printer is provided, such clamp permitting both angular and lateral repositioning and adjustment of the print drum on the shaft without dismantling or removing any of the parts or mechanisms of the printer.

3,724,368

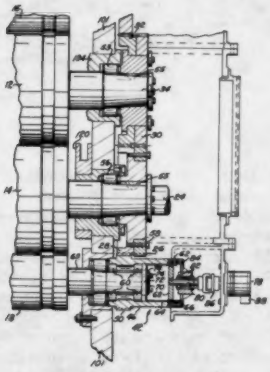
HARMONIC DRIVE REGISTER ADJUSTMENT DEVICE FOR A PRINTING PRESS

Ernest H. Treff, Groton, Conn., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed June 17, 1970, Ser. No. 47,048

Int. Cl. B41f *13/12*

U.S. Cl. 101—248 **2 Claims**



A printing press includes a first printing unit having a first blanket cylinder for printing one side of sheet material and a first plate cylinder associated with the first blanket cylinder for transferring an image to the first blanket cylinder. The printing press also includes a second blanket cylinder for printing the other side of the sheet material and a second plate cylinder associated with it for transferring an image thereto. The first and second blanket cylinders are positioned such that the images received by the respective plate cylinders are applied to the sheet material simultaneously. A register adjusting device circumferentially adjusts the relative positions of plate cylinders so that registry is maintained between the images applied to the sheet material. The adjusting means includes a harmonic drive unit drivingly connected to one of the plate cylinders so that the rotational position of that plate cylinder with respect to the other plate cylinder may be varied thereby.

3,724,369

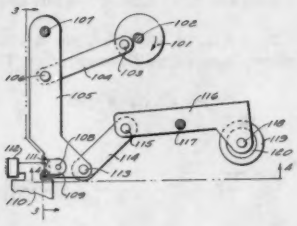
PRINTING MECHANISM FOR PRINTING ON FLAT OR CONTOURED SURFACES

Herbert C. Gery, Villas, and Marvin S. Samson, Lindenwold, both of N.J., assignors to Medical Electroscience and Pharmaceuticals, Inc., Cherry Hill, N.J.

Continuation-in-part of Ser. No. 861,712, Sept. 29, 1969, Pat. No. 3,635,154. This application Sept. 27, 1971, Ser. No. 183,944

Int. Cl. B41f *17/14*

U.S. Cl. 101—327 **6 Claims**



A printing mechanism wherein a pivoted arm carries a printing head facing tangentially of the arm for swinging movement into and out of printing engagement with articles to be printed, a pivoted lever carries inking means swingable with the lever into and out of inking engagement with the printing head when the latter is retracted from its printing position, operating means interconnect the lever and arm to effect simultaneous swinging movement thereof, and drive means power the arm and lever movement.

3,724,370

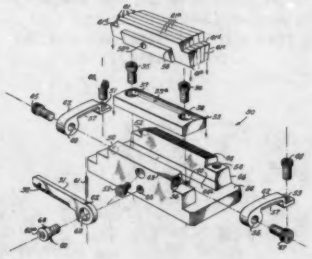
IMPRINTING CYLINDER WITH REMOVABLE IMPRINTING BLOCK

Ralph E. Martin, 7721 Bogart, Fort Worth, Tex.

Filed Dec. 28, 1971, Ser. No. 213,067

Int. Cl. B41f *27/06*

U.S. Cl. 101—377 **13 Claims**



An imprinting cylinder having a cut out portion and an imprinting block adapted to be removably insertable in the cut out portion of the imprinting cylinder. A locking lever pivotable on a screw is provided to pressure lock the imprinting block in the imprinting cylinder. Removable clips are fixed to the imprinting block to retain tapered hot metal cast type slugs. The taper of the hot metal cast type slugs is predetermined to effect a curvature of the imprinting surface paralleling that of the imprinting cylinder.

3,724,371

PROCESS FOR MANUFACTURING A TYPE-CARRYING PRINTING BELT

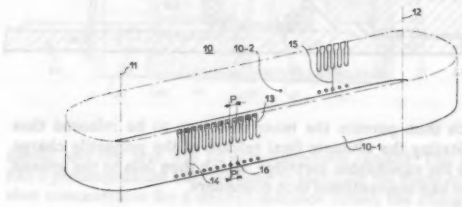
Michel Picard, Belfort, France, assignor to Societe Industrielle Honeywell Bull (Societe Anonyme), Paris, France

Filed Sept. 8, 1971, Ser. No. 178,663

Claims priority, application France, Sept. 15, 1970, 7033395

Int. Cl. B41b *1/02*

U.S. Cl. 101—401.1 11 Claims



A process for fabricating an endless type-carrying belt for an on-the-fly printer, wherein open belt portions are first prepared with type-carrying tongue portions defined along the length thereof, each of said tongue portions bearing a stud wherein a raised character is formed in each stud by coining by rolling, and wherein said open belt portions have the ends thereof joined together to form an endless belt.

3,724,372

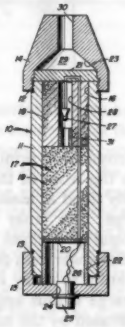
PYROJET CUTTER FOR UNDERWATER OR LAND USE

Ralph O. Phillips, Old Saybrook, Conn., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 30, 1963, Ser. No. 320,239

Int. Cl. F42b *33/06*

U.S. Cl. 102—1 R 4 Claims



1. An apparatus for burning through explosive containing cases and for melting out the enclosed explosive comprising a metal cylinder having a bore along the longitudinal axis thereof, said cylinder being externally-threaded at each of its ends;

first combustible solid propellant mixture which burns to produce a relatively high-temperature gaseous product positioned in said bore at one end thereof;

a second combustible solid propellant mixture which burns to produce a relatively low-temperature gaseous product positioned in said bore at the other end thereof;

means closing said one end of said bore including a labyrinthic metal disc and an internally threaded cap adapted for threaded engagement with said cylinder, said cap having an orifice therein and an internal wall tapering outwardly therefrom and defining a frusto-conical-shaped cavity therewithin, said wall abutting said disc for firmly fixing said disc over said bore;

means closing said other end of said bore including a metal sealing disc in said bore, an internally-threaded cap in threaded engagement with said cylinder and a spacer ring mounted between said sealing disc and said cap so that said spacer ring and said sealing disc urge said solid propellant mixtures against said metal disc at said one end of said bore, said last mentioned cap having an aperture therein;

and ignition means for igniting the solid propellant mixtures including a heat sensitive igniter material in contacting relationship with said first solid propellant mixture, an initiator for firing said igniter for firing said igniter material and means carried by said last named cap in sealed engagement with the wall of said aperture in said last named cap for actuating said initiator;

whereby the solid propellant mixtures are ignited in successive order and the gases developed from the burning thereof pass through a labyrinth path in the first-mentioned disc, build up pressure within the frusto-conical cavity of the first-mentioned cap and are discharged from the orifice therein as a high-velocity, gaseous jet, first having a relatively high temperature and then a relatively low temperature.

3,724,373

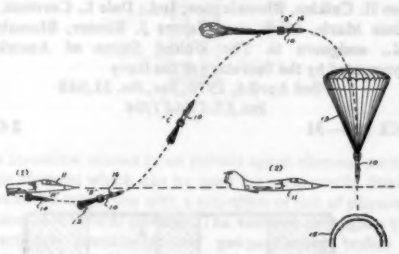
RETARDED GLIDE BOMB

Arnold S. Rivenes, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 15, 1970, Ser. No. 97,470

Int. Cl. F42b *25/02*

U.S. Cl. 102—4 7 Claims



An aerial bomb having a casing equipped with auxiliary airfoil surfaces hingedly mounted thereto, and movable between a retracted position in flush relation to the bomb casing and an extended position oriented at an angle-of-attack to the air stream to provide a lifting force to, and thus retard the fall of, the bomb and its subsequent explosive impact with the target area to thereby allow the delivery aircraft to reach a safe position.

3,724,374

UNDERWATER SOUND SOURCE

James Somerville, Chalfont; Donald F. Smith, and Joseph N. Yaccarino, both of Norristown, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 27, 1962, Ser. No. 190,836

Int. Cl. F42b *22/44*

U.S. Cl. 102—7 6 Claims

1. A buoy for use as an underwater sound source, comprising in combination:

an elongated cylindrical casing,

a circular plate rigidly fixed at one end of said casing,

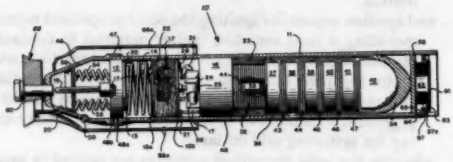
a pressure plate disposed at the other end of said casing,

charge means disposed adjacent said pressure plate means within said casing,

inflatable bag means disposed between said circular plate and said charge means,

means for inflating said bag means to eject said charge means from said casing when said pressure plate is released from said casing,

dome means,



clamp means secured to said dome means and extending the length of said casing releasably securing said pressure plate at said other end of said casing,

rotochute means secured to said dome means for retarding the buoy as it falls through the air,

said dome means including spring means biased between said dome means and said circular plate for ejecting said dome means and said clamp means from said casing when said clamp means release said pressure plate,

release means releasing said clamp means from said pressure plate in response to a predetermined pressure on said pressure plate.

3,724,375

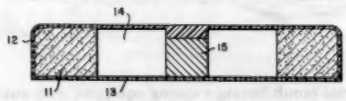
ILLUMINATING FLARE HAVING HIGH DRAG CONFIGURATION

Burton H. Calkins, Bloomington, Ind.; Dale L. Carstens, Sault Sainte Marie, Mich., and James J. Riester, Bloomington, Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 6, 1970, Ser. No. 31,040

Int. Cl. C06d *1/04*

U.S. Cl. 102—31 **2 Claims**



A flat, circular flare having a thin-walled plastic case containing a disk of pyrotechnic material provided with a star-center and having a fuze means for igniting said pyrotechnic material. The flat, circular flare is launched from an aircraft by spinning and the flare floats or sails to the ground while burning.

3,724,376

EXPENDABLE CASE SHOTSHELL

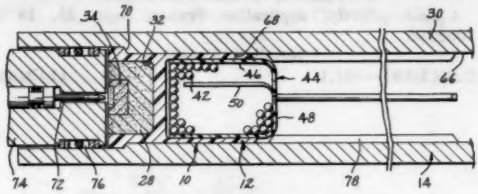
Martin W. Kordas, Stratford; Robert C. May, Fairfield, and John J. Scanlon, Monroe, all of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 755,649, Aug. 22, 1968. This application Feb. 2, 1971, Ser. No. 111,949

Int. Cl. F42b *5/30, 7/06*

U.S. Cl. 102—42 C **26 Claims**

An expendable cartridge made of thermoplastic material which is adapted to contain the necessary propellant, projectile charge, etc., and which is explosively expelled from the gun along with the projectile charge. There are several modifications of the invention, each of which requires some means to slit, fracture, or rupture the outermost cartridge structure,



which then permits the inner structure to be released thus facilitating the ultimate final release of the projectile charge from the expendable cartridge, which then falls to the ground much like conventional shot containers.

3,724,377

SHELL CARTRIDGES

Louis Birkigt, Pregny-Geneve, Switzerland, assignor to Brevets Aero-Mecaniques S.A., Geneva, Switzerland

Filed May 1, 1970, Ser. No. 33,580

Claims priority, application Luxembourg, May 7, 1969, 58.593

Int. Cl. F42b *13/06, 9/10*

U.S. Cl. 102—38 **10 Claims**

The cartridge case contains a principal propellant charge and a shell adapted to the front of the case having a rearwardly open axial cavity filled at least partly by a solid additional propellant charge. The latter is of greater calorific power than the principal propellant charge. A pastille of powder of lower calorific power than the additional propellant charge masks it rearwardly to delay its ignition. The energy from the additional charge is thus applied from the moment when the pressure generated by the main propellant starts to decrease. The performance of the shell is thus improved without generating dangerous excess pressures.

3,724,378

SHOT CONCENTRATOR

Randolph Bentley Knight, Queenstown, Md., and Lee Ayers Knight, 852 Amostown Road, West Springfield, Mass.

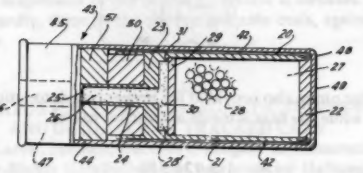
Filed May 13, 1969, Ser. No. 824,219

Int. Cl. F42b *7/08*

U.S. Cl. 102—42 C **1 Claim**

A shot concentrator adapted to be mounted in the casing of a shotgun shell having powder and a primer therein. The concentrator includes a cylindrical hollow tube having a capped forward end and an elongated stem projecting from its closed rear end. The stem has a passage therethrough which commu-

nicates with the interior and the exterior of the tube. A charge of powder and a charge of shot are positioned in the tube. A fuse is located in the stem in communication at one end with the charge of powder in the tube and adapted for communication at the other end with the powder in the casing so that when the primer is detonated, the shot concentrator will be expelled from the casing by the explosion of the powder in the



casing and the fuse will be simultaneously ignited. The fuse has a predetermined burning time to facilitate the flight of the shot concentrator for a desired distance before the charge of powder in said concentrator is ignited by the fuse and the charge of shot is thereby separated from the shot concentrator. In this manner, a more accurate and more concentrated pattern of shot is provided at a greater greater distance from the point of initial firing of a shotgun shell.

3,724,379

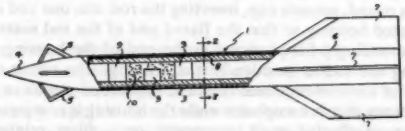
WARHEAD FOR GUIDED MISSILES

Dale M. Davis, Freeport, Fla., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Oct. 5, 1966, Ser. No. 584,946

Int. Cl. F42b *13/18, 13/30*

U.S. Cl. 102—49.3 **5 Claims**



An improved air-to-surface missile having a warhead which is confined solely to the lower half of the missile, and this half contains all the fragments which would normally be distributed throughout both halves of the missile. An upper casing portion need not be employed except to maintain symmetry and aerodynamic stability of the missile as a whole.

In order to offset the slewing effect of the fragment pattern at the target on account of a low angle of approach, the fragmented lower surface of the warhead is flattened as it extends toward the rear end and is also curved upwardly so as to approach the longitudinal axis of the missile which contains the warhead.

3,724,380

DEVICE FOR A PROJECTILE

Bjorn Herman Olof Simmons, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

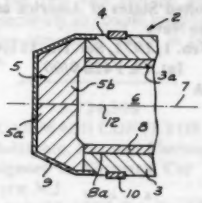
Filed Dec. 16, 1970, Ser. No. 98,540

Claims priority, application Sweden, Jan. 8, 1970, 149/70

Int. Cl. F42b *13/38*

U.S. Cl. 102—60 **4 Claims**

A flare releasing missile has a casing including the propellant charge and a hollow projectile fitted to the casing and housing a flare and a parachute therefor. The projectile including its bottom plate is lengthwise split and the projectile parts thus formed are held together by a cap fitted upon the bottom of the projectile until the same is fired. Upon firing of the projectile the cap is forced off thereby freeing the projectile parts and thus the flare with its parachute. The projectile



parts are thrown out of the trajectory of the flare by the centrifugal force acting upon the parts due to the spin imparted to the projectile by the rifling in the gun barrel.

3,724,381

TEAR GAS ELEMENT

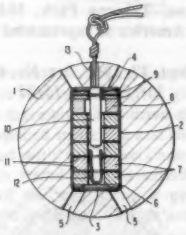
Heinz Gawlick, Furth; Gunther Marondel, Erlangen; Werner Siegelin, Stein; Wolfgang Wasser, and Hellmut Bendler, both of Nurnberg, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed June 26, 1970, Ser. No. 50,172

Claims priority, application Germany, June 28, 1969, P 19 33 029.1

Int. Cl. F42b *27/06*

U.S. Cl. 102—65 **8 Claims**



This invention relates to an irritant agent element such as a tear gas element which can be used for temporarily disabling persons at the target site with a minimum of risk of physical injuries and mechanical damage. The element comprises a tear gas cartridge containing tear gas-producing bodies and detonator and combustion means for deflagrating said tear gas-producing bodies, the feature of the invention residing in the provision of an envelope of resilient, readily deformable material surrounding said cartridge. Channels are provided in the envelope for the emanation of the tear gas from the cartridge.

3,724,382

CASELESS SMOKE GRENADE INCLUDING POLYVINYL CHLORIDE BINDER

Hector Joseph Zilcosky, Colebrook, Conn., assignor to The Ensign-Bickford Company, Simsbury, Conn.

Filed Sept. 23, 1971, Ser. No. 183,252

Int. Cl. F42b *27/00*; C06d *3/00*

U.S. Cl. 102—65 **12 Claims**

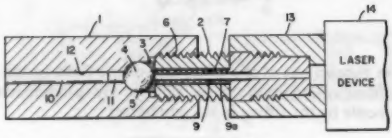
A caseless smoke generating grenade consists essentially of a cast flexible main charge. The flameless pyrotechnic composition used in the main charge is comprised of substantially equal proportions of zinc oxide and a perchlorate oxidizer distributed throughout a plasticized polymeric resin fuel having a high halogen content. The composition is free of solvent and provides controlled burning coupled with excellent flexibility, cohesive strength and impact resistance.

3,724,383

LASSER STIMULATED ORDNANCE INITIATION DEVICE

John A. Gallaghan, Ben Lomond; Ronald W. Benson, Cupertino, and Bertil V. Carlson, Santa Cruz, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 1, 1971, Ser. No. 111,473
Int. Cl. F42b *9/00*
U.S. Cl. 102—70.2 A **3 Claims**



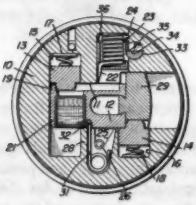
A device for generating a high order detonation by using fiber optics and a spherical glass focusing head to distribute the initiating light pulse and a low energy laser to initiate the explosive material. Potassium Hexanitro Diphenylamine (KHND), a secondary explosive, is initiated by the device to a low order detonation which in turn sets off Pentaerythrital Tetranitrate (PETN), another secondary explosive material, to give a high order detonation.

3,724,384

CENTRIFUGALLY ARMED FUZE

William J. Donahue, Takoma Park, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 27, 1965, Ser. No. 491,856
Int. Cl. F42c *15/22*
U.S. Cl. 102—79 **5 Claims**



A centrifugally armed fuze having a spring-biased, spin-actuated slider containing a stab detonator. Once armed at a first predetermined rotational velocity, a compound lever system, having two centrifugally responsive sears, restrains a spring-biased firing pin until the spin rate decays to a second (lower) predetermined rotational velocity.

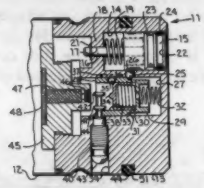
3,724,385

FUZE HAVING A PNEUMATIC AND INERTIA ARMING SYSTEM

Bobby D. Beatty, Bloomfield; Gary D. Butts, Loogootee; Stanley J. Herold, Switz City, and Donald E. LaGrange, Washington, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 20, 1971, Ser. No. 181,791
Int. Cl. F42c *5/00*
U.S. Cl. 102—81 **2 Claims**

A fuze for a pyrotechnic device having a firing pin for detonating a primer. An inertia sleeve is provided for preventing forward movement of the firing pin until a pneumatic latch is operated by the pressure supplied by a launching force. A



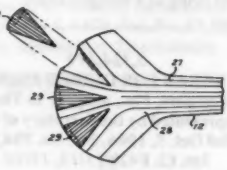
borerider pin is also provided for preventing detonation of the primer while the fuze is inside a launcher barrel.

3,724,386

ABLATIVE NOSE TIPS AND METHOD FOR THEIR MANUFACTURE

Donald L. Schmidt, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed June 24, 1970, Ser. No. 49,406
Int. Cl. F42b *15/00*
U.S. Cl. 102—105 **9 Claims**



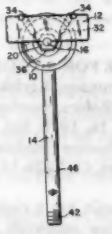
An ablative nose tip assembly is produced by fabricating a nose tip comprising a rod having one of its ends flared so as to form a round, arcuate cap, inserting the rod into one end of an elongated housing so that the flared end of the rod seats in a correspondingly flared recess in the end of the housing, and locking the rod in position in the housing. The rod is composed of an unidirectional filament reinforced plastic or carbonaceous matrix composite while the housing is comprised of a fiber reinforced resin composite or a fiber reinforced pyrolyzed matrix composite. The nose tip assembly is dimensionally stable, rendering it useful in high speed aerospace vehicles subjected to intense aerodynamic heating and stagnation pressures during passage through a planetary atmosphere.

3,724,387

CONVEYOR SUSPENSION TRACK AND TROLLEY SYSTEM

Joseph A. Civitarese, 69 Park Avenue, Lodi, N.J.

Filed Feb. 18, 1971, Ser. No. 116,370
Int. Cl. B61b *3/00*; **B65g** *17/20*; **E01b** *25/22*
U.S. Cl. 104—93 **15 Claims**



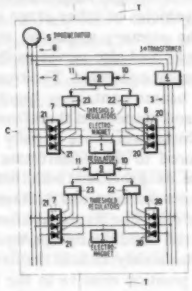
An improved trolley hanger structure for a track conveyor system comprising a sheave, adapted to ride on the exterior of

a tubular rail, rotatably mounted on an axle immovably fixed to a vertically open box frame and semi-journalled therethrough at one end to a depending vertical shank supporting a clothes hanger rack or like structure, and at the other end through a novel spring clip retaining the axle end on the box frame. In another embodiment, a pair of sheaves are supported via two novel spring clips to a similar box frame. The novel clip or clips serve only a retaining function since the weight of suspension of the conveyor system is directed vertically upwardly, through the sheave and axle ends, against the box frame.

3,724,388
APPARATUS FOR ELECTROMAGNETIC SUSPENSION AND GUIDANCE OF TRACKED CARS

Ludwig Karch, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Oct. 1, 1971, Ser. No. 185,521
Claims priority, application Germany, Oct. 27, 1970, P 20 52 599.9
Int. Cl. B61b *13/08*
U.S. Cl. 104—148 MS **8 Claims**

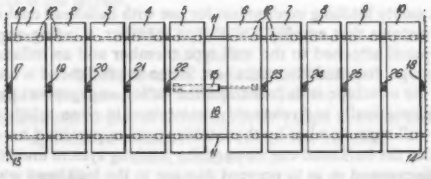


In the apparatus disclosed current is supplied to electromagnets which suspend and / or guide the cars that travel along tracks in an electromagnetic suspension system. The current is alternately supplied along two mains from a single generator. One main exhibits the voltage rated for the electromagnets of the car and the other a voltage which is higher than the rated voltage by an order of magnitude. The higher voltage main supplies high voltage pulses or shock currents for stabilizing cars which deviate slightly from the normal path along the track in response to transverse winds or other transverse forces.

3,724,389
STORAGE FACILITY

Richard Johnson Greaves, Victoria, Australia, assignor to Brownbuilt Limited, Victoria, Australia

Filed April 14, 1971, Ser. No. 134,020
Claims priority, application Australia, April 14, 1970, PA 0897/70
Int. Cl. B61b *13/12*
U.S. Cl. 104—162 **5 Claims**

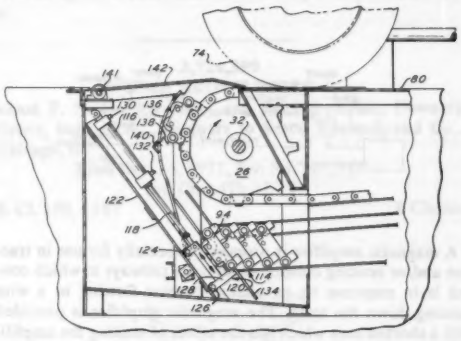


A mobile storage facility comprising a plurality of storage structures arranged successively along a track and each movable along the track, power means connected between an intermediate pair of said storage structures and operable to cause relative movement between them, and coupling means selectively to couple the two end storage structures to fixed anchorages and selectively to couple together each successive pair of said storage structures which is not both the intermediate structures.

3,724,390
CAR WASH CONVEYOR

Carl C. Beer, Philadelphia, Pa., and Sherman L. Larson, Palmyra, N.J., assignors to Sherman Car Wash Equipment Company, Palmyra, N.J.

Filed Aug. 20, 1970, Ser. No. 65,564
Int. Cl. B65g *15/30*
U.S. Cl. 104—172 B **8 Claims**

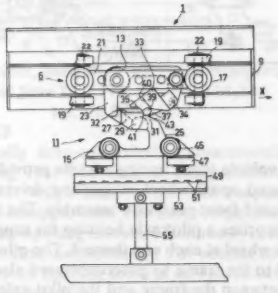


A conveyor for an automobile or car washing system includes endless drive chains having a plurality of dollies removably engaged therewith. The drive chains are continuously driven about spaced sprockets and the dollies are selectively interconnected with the drive chains. The dollies include pushers which travel along a wheel-engaging path to move the wheels of the car along a predetermined path through the car washing system. Dollies are connected to the drive chains upon actuation of a switch sensing the presence of the car or by other electrical or mechanical means.

3,724,391
OVERHEAD CONVEYOR

Harm Frank Te Velde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Claims priority, application Netherlands, Jan. 27, 1970, 7001084
Int. Cl. B65g *17/42*
U.S. Cl. 104—172 S **16 Claims**



A conveyor having a main track and a local lower track and having double trolleys each being formed of a driving crab and

a suspension crab. The suspension crab is detachably coupled to the driving crab by means of a self-centering ball and socket type coupling. In the coupled condition the suspension crab is locked against undesired uncoupling by safety means formed of a locking pawl pivotally arranged to engage various cam surfaces of the crabs in order to prevent undesired uncoupling.

3,724,392

MAGNETIC AMPLIFIERS AND APPARATUS

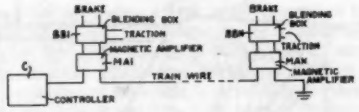
Arthur Maskery, London, England, assignor to Westinghouse Brake and Signal Company, Limited, London, England

Filed Oct. 26, 1970, Ser. No. 83,731

Claims priority, application Great Britain, Nov. 5, 1969, 54,142/69

Int. Cl. B61e 3/02; H03f 9/00

U.S. Cl. 105—61 3 Claims



A magnetic amplifier is proposed especially for use in traction and/or braking control systems for railways in which control is in response to an analog current flowing in a wire running down the train. The magnetic amplifier is provided with a shorted turn which has the effect of making the amplifier largely independent of d.c. control source impedance variations thereby avoiding requirements for recalibration when the cars of a train are changed for example.

3,724,393

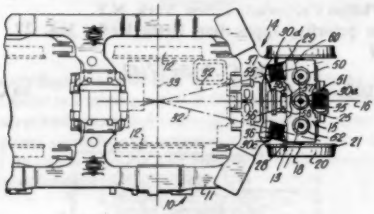
RESILIENTLY BIASED PILOT AXLE ARRANGEMENT

John Henry Parker, 730 Saint Aubin Street, Saint Laurent, Quebec, and F. Thomas McInerney, III, 190 de Normandie Saint, Bruno, Quebec, both of Canada

Filed Feb. 11, 1971, Ser. No. 114,656

Int. Cl. B61f 3/02, 5/30, 5/38

U.S. Cl. 105—174 13 Claims



A railway vehicle truck having a frame provided with a plurality of spaced apart wheel supporting driven axles and a resiliently biased front pilot axle assembly. The front idle axle assembly comprises a pilot axle housing for supporting a pilot axle having a wheel at each end thereof. The pilot axle housing is connected to the frame by precompressed elastomer blocks interposed between the frame and the pilot axle housing. The precompressed elastomer blocks permit smooth guided movement of the pilot axle housing in an arcuate horizontal plane and in the vertical plane.

3,724,394

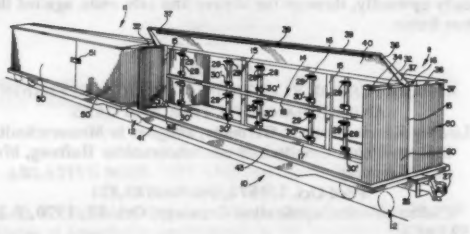
RAILWAY CAR

William L. Pringle, Grosse Pointe Shores, Mich., assignor to Pullman Incorporated, Chicago, Ill.

Filed Aug. 21, 1970, Ser. No. 65,872

Int. Cl. B60p 3/06; B61d 45/00

U.S. Cl. 105—368 R 6 Claims



A railway car consists of articulated sections each including a substantially identical upright longitudinally extending truss structure on which vehicles or other cargo is suspended. The truss structure is the primary structural member extending between the car trucks and also serves as the cargo retaining member during transport operation. The truss structure is provided with suitable beams containing brackets to which the cargo is connected and suspended therefrom. The cargo may be in the form of vehicles which are initially connected to pallets or fixtures secured to the underframe members of the vehicle. The fixture is provided with brackets which interengage the brackets on the truss structure to suspend the vehicles directly thereon. The fixture is constructed so that a crane or other material handling device, by engaging and lifting the fixture simultaneously, rotates the fixture and the vehicle into the desired position relative to the truss, the loading operation consisting merely of hanging the fixture and vehicles on the truss so that both are removably retained thereon in suspended relation.

3,724,395

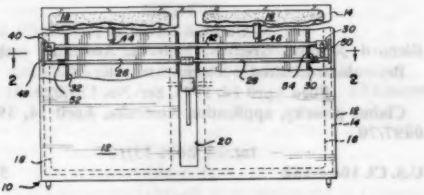
INTERLOCKING DEVICE FOR INFLATABLE BULKHEADS

Samuel H. Enochian, Thornton, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Oct. 26, 1971, Ser. No. 192,148

Int. Cl. B61d 45/00; B60p 7/14

U.S. Cl. 105—369 BA 5 Claims



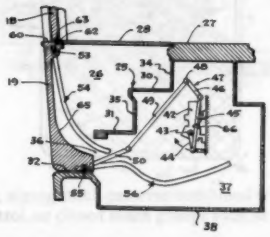
A safety latching mechanism for use with bulkhead cushioning systems that employ a wall-type member, a lading-engaging panel attached to the wall-type member and an inflatable envelope disposed therebetween. When the bulkhead is not in use the envelope is deflated and the lading-engagement panel is automatically and releasably maintained in close relation to the wall-type member by the latching system provided herein. Before the bulkhead can be used the latching system must first be disengaged so as to prevent damage to the bulkhead which might result from inflation of the envelope when the panel and wall-type member are latchably secured in close relation.

3,724,396

DOOR SYSTEM FOR HIGH-LOW PLATFORMS

Carl W. Roth, Arlington Hts., Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Feb. 18, 1971, Ser. No. 116,409
Int. Cl. B61d *19/00, 23/00*
U.S. Cl. 105—378 10 Claims



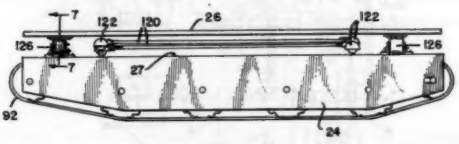
A door system for a railway passenger vehicle to enable both high and low platform loading of passengers, including a pair of bi-parting doors to be opened for high-level loading, and a low door immediately below the bi-parting doors to be opened with the bi-parting doors for low level loading, and a stair unit coacting with the low door accessible through a trap door, and means for retracting the low door within the car structure behind the stair unit.

3,724,397

ENDLESS TRACK VEHICLES

Freeman E. Sargent, Old Chesterfield Road, Winchester, N.H.

Division of Ser. No. 840,801, July 10, 1969, abandoned. This application Aug. 2, 1971, Ser. No. 168,264
Int. Cl. B62d *55/00*
U.S. Cl. 180—9.54 3 Claims



An endless track vehicle, including a frame, a body on the frame, a pair of endless tracks, independently operated, so that each track can operate at varying speeds, and even in reverse to one another, a closed hydraulic system including connecting pipes to and from a fluid tank, an hydraulic pump, driving fluid to two two-way hydraulic control valves leading to two reversible hydraulic motors each separately driving a track, a gasoline powered engine having a shaft attached to the crankshaft.

A modification includes the same mechanism in which the body is divided into two separate longitudinal sections, each supporting an endless track, and is connected by independent suspension means so that each track is independently mounted to permit the track to separately conform to irregularities in the terrain.

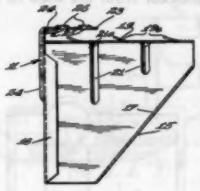
3,724,398

EXPENDABLE PALLET DEVICE

Francis P. Brennan, 1057 Rolling Drive, Lisle, Ill.

Continuation-in-part of Ser. No. 70,407, Sept. 8, 1970. This application March 15, 1971, Ser. No. 123,982
Int. Cl. B65d *19/00*
U.S. Cl. 108—51 13 Claims

An expendable pallet leg preformed to provide locking flanges or shelves for selectively attaching a plurality of pallet legs at spaced locations on the material to be transported or handled by a lift truck such as stacks of corrugated boards,



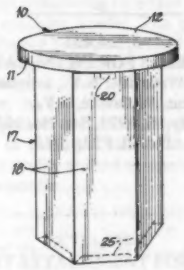
laminar metal sheets, ply-wood or other sheet-form material, or to corrugated boxes used for handling transportable articles.

3,724,399

KNOCKDOWN TABLE

Michael F. Notko, Riverside, and Peter J. Hylak, Downers Grove, both of Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.

Filed Dec. 14, 1971, Ser. No. 207,918
Int. Cl. A47b *13/02*
U.S. Cl. 108—157 8 Claims



A two-piece knockdown table formed of a corrugated paperboard base and a table top member supported thereon. The two pieces which form the table are adapted to be shipped in flat condition and to be erected at the point of use into a table which has substantial stability and strength. The table top member is formed with a depending flange which is adapted to engage the panels of the base member. The base member has tabs which engage slots formed in the depending flange member of the table top member to secure the base member to the top member.

3,724,400

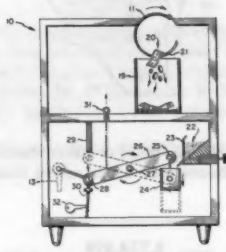
SAFE

Theodore E. Steiber, 2600 Park Avenue, Bridgeport, Conn.

Filed June 26, 1972, Ser. No. 158,224
Int. Cl. E05g *1/00*
U.S. Cl. 109—53 4 Claims

A mechanically time-controlled compartmentized safe is provided having first and second compartments, each of which has a door with a lock thereon and a separate key for unlocking each compartment. The first compartment contains a one-way access opening therein which receives and deposits valuables in the first compartment. The second compartment contains the key for opening the first compartment, and also a mechanical time-controlled blocker which prevents positioning the key in the lock of the second compartment to open it until the blocker is removed. The blocker is mounted on one end of a lever which is pivoted in the center and has on the

other end thereof a container in which sand is released from the time control, consisting of a box of sand which is released by a push rod on the outside of the second compartment. When enough sand is deposited in the container, the lever pivots, raising the blocker from the lock of the second com-



partment and allowing the insertion of the key thereto in the opening of the second compartment to obtain the key and thus open the first compartment. Accordingly, only authorized persons would have access to the valuables deposited in the first compartment, but only after a time delay in accordance with the sand timer.

3,724,401

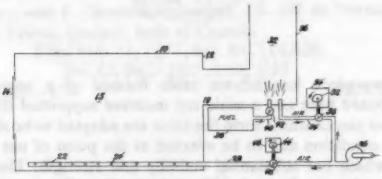
CONTROLS FOR INCINERATOR

Eugene D. Krumm, Wellsville, N.Y., assignor to The Air Preheater Company Inc., Wellsville, N.Y.

Filed July 16, 1971, Ser. No. 163,198

Int. Cl. F23g *5/12*

U.S. Cl. 110—8 R **7 Claims**



A solid waste incinerator having a control system responding to predetermined conditions that exist within the combustion chamber thereof during a normal burning operation. The usual system of complex temperature and pressure sensors is replaced by a simple controller that operates in response to a predetermined set of average values independent from those at that time in the combustion chamber.

3,724,402

WEBBED PANEL FOR CHAIRS

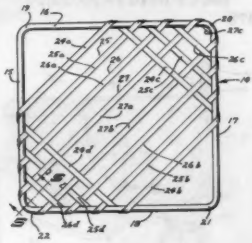
Paul D. Thyberg, St. Paul, and Wallace G. Splettstoeszer, Watertown, both of Minn., assignors to General Housewares Corp., New York, N.Y.

Filed June 11, 1971, Ser. No. 152,071

Int. Cl. A47g *5/00*; E06b *3/30*

U.S. Cl. 160—371 **4 Claims**

A panel for use as the seat or back of a lawn chair or the like wherein strands of webbing extend diagonally between portions of a rectangular peripheral frame to provide a flexible surface, the webbing herein comprising closed loops of a



uniform and predetermined size which are interwoven with each other and secured to the frame without independent attachment means.

3,724,403

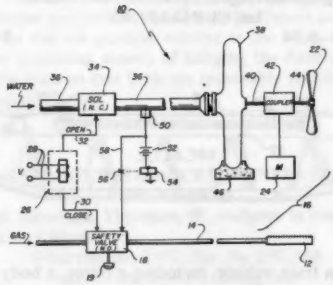
FORCED-DRAFT FURNACE SYSTEM

Karl H. Frantzen, Omaha, Nebr., assignor to Northern Natural Gas Company, Omaha, Nebr.

Filed Nov. 12, 1971, Ser. No. 198,345

Int. Cl. F23c *7/00*

U.S. Cl. 110—72 R **7 Claims**



An improved forced-draft heating system wherein the blower can be selectively driven by an alternate power source during electrical power interruptions to remove heated air from the plennum, the system including a water turbine operable from conventional municipal water lines, a coupler for coupling the turbine to the blower and decoupling the blower from the usual electrical motor drive, and manual by-pass means to reconnect the burner to the fuel source during electrical power interruptions.

3,724,404

FANCY STITCH ZIGZAG SEWING MACHINES

Walter H. W. Marsh, Fanwood, and Lionel J. Coulombe, Matawan, both of N.J., assignors to The Singer Company, New York, N.Y.

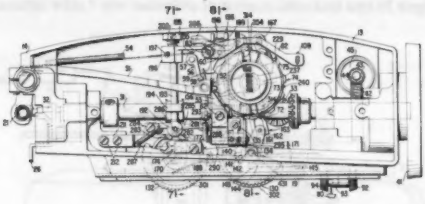
Division of Ser. No. 827,867, May 26, 1969, Pat. No. 3,585,876. This application Jan. 4, 1971, Ser. No. 38,596

Int. Cl. D05b *3/02*

U.S. Cl. 112—158 B **1 Claim**

A zigzag sewing machine is disclosed which can

exchangeably accommodate any one of a variety of differently organized special cam units for producing special patterns of



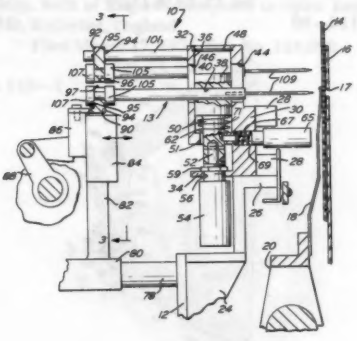
zigzag stitches, zigzag stitch patterns combined with patterned work feed control, or closed stitch groups such as buttonholes.

3,724,405

COLOR CHANGE MECHANISM FOR AN EMBROIDERING MACHINE

Daniel J. Mullen, Jr., Southampton, Pa., assignor to Penn Novelty Co., Philadelphia, Pa.

Filed July 15, 1970, Ser. No. 55,131
Int. Cl. D05b *55/16*
U.S. Cl. 112—221 **10 Claims**



A color change mechanism that comprises actuators associated with each of a plurality of embroidering needles to move them from an inoperative position to an operative position where they engage a reciprocating needle bar and are driven into contact with a material to be embroidered. Adjacent needles are threaded with different colored threads so that by selectively actuating predetermined actuators the color of the embroidered design can be controlled.

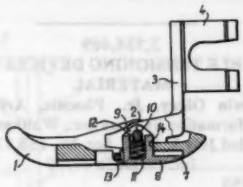
3,724,406

PRESSER FOOT FOR A SEWING MACHINE

Marcel Fresard, Petit-Lancy, and Jean-Pierre Gabriel, Geneva, both of Switzerland, assignors to Mefina S.A., Fribourg, Switzerland

Filed May 21, 1971, Ser. No. 145,837
Claims priority, application Switzerland, June 2, 1970, 8203/70
Int. Cl. D05b *29/00*
U.S. Cl. 112—235 **5 Claims**

The presser foot has a sole plate pivoted by an axle to a support attached to the presser bar. A portion of the sole plate behind the needle passage hole is upwardly retractable against the action of a spiral spring and is suspended from the axle. Stops, formed by a transverse rod fixed in the sole plate between the needle passage hole and the retractable portion



and by an inner edge of the sole plate, limit the oscillation of the retractable portion. The spring is housed in the retractable portion and bears against the axle. Vertical grooves in the retractable portion act as vertical guides. The parts of the foot can be of plastics material.

3,724,407

SNAP-ON ZIPPER FOOT

Friedhelm Simon, Karlsruhe, Germany, assignor to The Singer Company, New York, N.Y.

Filed March 15, 1972, Ser. No. 234,963
Int. Cl. D05b *29/08*
U.S. Cl. 112—240 **1 Claim**

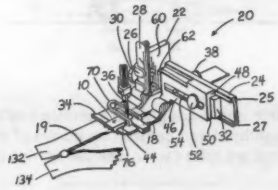
A sewing machine presser foot is disclosed which may be readily connected for positioning on either the right or the left side of the sewing machine needle. The presser foot is constructed with a U shaped bracket attached to a sole plate, the bracket having a pivot pin extending between the sidewalls. A shiftable spacer block is carried by the pivot pin leaving sufficient space between the block and a sidewall of the bracket for insertion of the presser foot shank. By inserting the presser foot shank on one or the other side of the spacer block the presser foot may be bodily shifted to one or the other side of the sewing machine needle.

3,724,408

CHANNEL INSERT ATTACHMENT FOR A ZIPPER FOOT

Leoda J. Gooderum, 627 Charles Street, La Crosse, Wis.

Filed March 3, 1971, Ser. No. 120,534
Int. Cl. D05b *29/12*
U.S. Cl. 112—240 **5 Claims**



An attachment for a channel zipper foot accommodating the guiding of a zipper chain as the zipper foot stitches the zipper tape to garments. The attachment inserts into the channel of a zipper foot becoming engageable with the zipper tape. The configuration of the body of the attachment will retain the attachment into its inserted position during a forward or rearward stitch of the sewing machine operation. Zipper chains may be received into a channel formed into the underside of the attachment. A specially shaped attachment becomes an

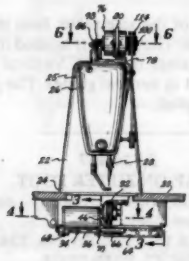
accessory part of a zipper foot to be inserted into a channel already present in the zipper foot, to provide the presser foot with a particular and specially shaped configuration of a channel which is capable of turning and rolling a concealed zipper chain from its otherwise natural position as it also guides the chain.

3,724,409

CONTROLLABLE TENSIONING DEVICES FOR STRAND MATERIAL

Frederick Darwin Olney, Jr., Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed July 1, 1971, Ser. No. 158,715
Int. Cl. D05b *47/00*
U.S. Cl. 112—255 **5 Claims**



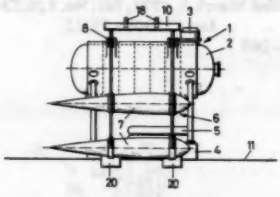
Command responsive devices allow tension adjustments to be made to a strand material on a sewing machine during the sewing operation. The devices comprise an upper strand tensioning device and a lower strand tensioning device, both of which are adapted to apply various tension values to the respective strands in accordance with the command signals received.

3,724,410

COUPLING SUBMERSIBLE TO SERVICE CRAFT

Harmannus Henderikus Lok, Ierseke, Netherlands, assignor to Nereid N.V., Ierseke, Netherlands

Filed April 26, 1971, Ser. No. 137,523
Int. Cl. B63g *8/00*; B63b *35/44*
U.S. Cl. 114—16 R **10 Claims**



A submersible unit is coupled to a service craft under water while being stabilized and centred by means of arms carrying pontoons, which are raised to engage the service craft.

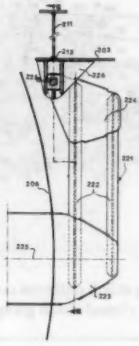
3,724,411

SUPPORT FOR A SELF-CARRYING STORAGE OR CONVEYING TANK

Jean H. Alleaume, Saint-Cloud, France, assignor to Technigaz, Paris, France

Filed Feb. 4, 1971, Ser. No. 112,570
Claims priority, application France, March 26, 1970, 7010991
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 T **14 Claims**

A suspension device for a vehicle-borne rigid storage tank consisting of spaced fastening supports connected to the vehicle structure and to the tank. The supports are distributed horizontally about the tank. The connections between the supports and vehicle structure are provided by rigidly interconnected beams parallel with a horizontal plane of the vehicle and are arranged in a polygonal, convex configuration surrounding the tank.

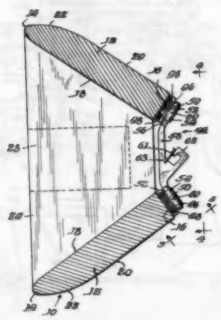


3,724,412

MAST FOR SAILING VESSELS

Joseph G. Blecker, 6101 Sheridan Road East, Chicago, Ill.

Continuation-in-part of Ser. No. 869,457, Oct. 27, 1969, abandoned. This application May 26, 1971, Ser. No. 147,065
Int. Cl. B63b *15/00*
U.S. Cl. 114—90 **14 Claims**



A mast for sailing vessels which includes a pair of elongated spars secured together in laterally spaced relation with their longitudinal axes substantially parallel and with longitudinal median planes containing the major cross-sectional axes of the spars intersecting such that the spars are angularly related and improve air flow over the leeward side of a sail, a base support block for securing the mast to a boat in upstanding relation, and sail attaching means for attaching a sail to the mast longitudinally therealong.

3,724,413

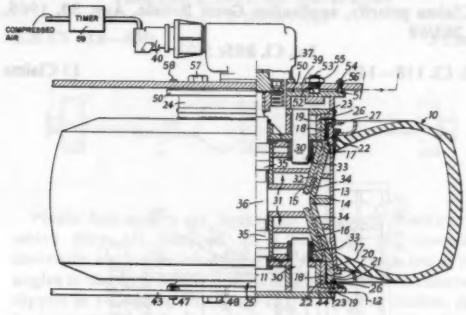
ROTATABLE FENDERS

John Duncan, Giles, and Graham Arthur Nigel Hart, Aylesbury, both of England, assignors to Helsband's Shipyards Limited, Marchwood, England

Filed Aug. 25, 1970, Ser. No. 66,780
Claims priority, application Great Britain, Sept. 19, 1969, 46,405/69
Int. Cl. B63b *21/56*
U.S. Cl. 114—220 **6 Claims**

A fender, primarily for marine use, comprises a tyred wheel rotatably mounted in a support structure and clutch means

operable to prevent rotation of the wheel. The clutch means comprises a pair of opposed, externally frusto-conical clutch elements which are movable in unison into and out of engagement with respective complementary internally frusto-conical surfaces formed in the hub of the wheel. The clutch means includes a device for automatically taking up the wear on the clutch faces.



3,724,414

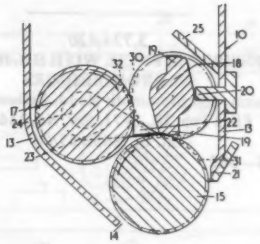
APPARATUS FOR SPREADING BUTTER AND LIKE SPREADABLE SUBSTANCES

Robert James Wicksteed, Kettering, and David Henry Wood, Uxbridge, both of England, assignors to Spiro Engineering Limited, Kettering, England

Filed March 17, 1971, Ser. No. 125,090

Int. Cl. B05c *1/02*

U.S. Cl. 118—1 **5 Claims**



Apparatus for spreading butter including a butter-applying roller is rotatably mounted in a container and has a portion of its periphery extending through a slot in the container. A toothed kneading member is also rotatably mounted in the container adjacent the butter-applying roller, the teeth on the kneading member extending between abutments fixed in the interior wall of the casing. A feed conveyor or roller is provided for feeding slices of bread past the butter-applying roller.

3,724,415

CONTROLLING SPRAY GUNS

Howard Richard James Knight, Hampton, England, assignor to Carrier Engineering Company Limited, London, England

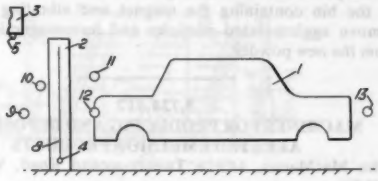
Filed Aug. 28, 1970, Ser. No. 67,868

Claims priority, application Great Britain, Sept. 3, 1969, 43,669/69

Int. Cl. B05c *11/00*; B05b *3/00*

U.S. Cl. 118—2 **10 Claims**

A spray gun for coating surfaces of a succession of articles of different shapes and sizes has the position of emission of liquid therefrom maintained substantially at a predetermined distance from the surface being sprayed by a variable profile cam the profile of which is automatically varied by adjusting means operable under control of control means which in turn is controlled by sensing devices located along the path of the article and which are arranged to sense the shape and size of the article.



3,724,416

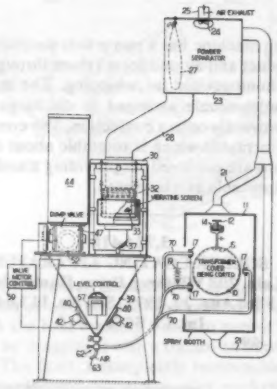
ELECTROSTATIC RESIN POWDER SPRAY SYSTEM HAVING IMPROVED POWDER DISPENSING MEANS

Harold G. Diamond, Wexford, and Floyd L. Gustine, Pittsburgh, both of Pa., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 722,078, April 17, 1968, abandoned, and a continuation-in-part of Ser. No. 728,253, May 10, 1968, abandoned. This application May 28, 1970, Ser. No. 41,229

Int. Cl. B05b *5/02*

U.S. Cl. 118—7 **17 Claims**



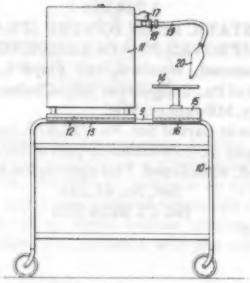
An electrostatic spray system for resin coating metallic articles heated above the melting temperature of the resin and moved on a conveyor through a spray booth past spray nozzles for resin powder includes means for recovering and recirculating the overspray resin particles which do not come into contact with the heated article, a bin for the recovered resin powder containing a magnet and a vibrating screen for cleaning the power, a supply hopper below the recovered power bin having venturis at its lower end operated by a pressurized air source for controlling the supply of powder to the spray nozzles, means driven by a motor for delivering new powder to the supply hopper, and means for detecting the level of new and recirculated powder in the supply hopper and for energizing the motor only when the powder in the supply hopper is below a predetermined amount which will prevent agglomeration and compacting of the resin powder particles. In one embodiment a hopper for new resin powder is disposed above the supply hopper, a rotatable valve at the lower end of the new powder hopper is rotated by an electric motor and controls

the amount of new powder delivered to the supply hopper, and the powder level detecting means controls the energization of the electric motor. In an alternative embodiment, a flexible screw conveyor driven by an electric motor controlled by the powder level detecting means delivers the new powder to the bin containing the magnet and vibrating screen to remove agglomerated particles and ferromagnetic particles from the new powder.

3,724,417
MACHINES FOR PRODUCING AND DEPOSITING AERATED EMULSION PRODUCTS

John MacManus, 143-16 Twenty-second Road, Whitestone, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,103
Claims priority, application Great Britain, Sept. 5, 1969, 44,034/69; Oct. 13, 1969, 50,267/69
Int. Cl. A21c *15/00*
U.S. Cl. 118—24 11 Claims

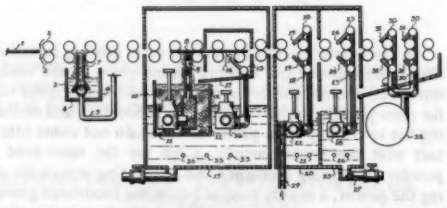


A whipping machine has a pump that simultaneously draws in liquid product and air and forces them through a static narrow orifice homogeniser for whipping. The machine has at least one outlet nozzle arranged to discharge the whipped product downwardly onto a confection. The confection is supported on a turntable which is rotatable about a vertical axis. Various means are disclosed for providing translational movement of the turntable as it is rotated.

3,724,418
SOLDER COATING APPARATUS

John H. McLain, 208 Winthrop Drive, Huntsville, Ala.

Filed Aug. 20, 1971, Ser. No. 113,044
Int. Cl. B05c *11/10*
U.S. Cl. 118—69 5 Claims

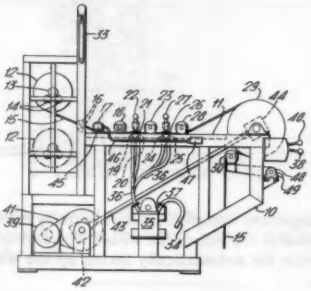


This invention, relating to the application of a thin uniform coat of hot tin lead solder to the exposed copper circuitry of electrical circuit boards utilizes a fluxing station, a standing wave soldering station, a hot liquid spray leveling station, a hot water spray cleaning station, a high volume air spray drying station and a conveyor for transporting the electrical circuit boards past the afore mentioned stations. The apparatus contains those pumps, motors, tanks, and electrical and hydraulic systems necessary to support the afore mentioned stations, more fully described in the drawing and in the body of the disclosure.

3,724,419
CLOTH IMPREGNATING MACHINE

Michael Edward Richard Collis, Southampton, England, assignor to Vosper Thornycroft Limited, Portsmouth, England

Filed Aug. 24, 1970, Ser. No. 66,306
Claims priority, application Great Britain, Aug. 30, 1969, 43,283/69
Int. Cl. B05c *5/02*
U.S. Cl. 118—119 11 Claims

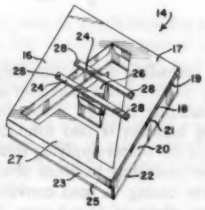


A machine for continuously impregnating a web of cloth with a resin mixture has a bed over which the web of cloth passes. Accelerated resin and catalysed resin are supplied by a pump through pairs of transverse slots in the bed to the lower surface of the web and the resin mixture is worked into the web by circumferentially grooved power driven rollers contacting the upper surface of the web which also advance said web along the bed. At the output end of the bed the web passes around a plain power driven roller and is doubled back beneath the bed to pass around a longitudinally grooved delivery roller from which the web is dispensed vertically downwards.

3,724,420
COMPRESSIBLE STENCIL WITH HIGH WALLS AND NARROW BRIDGES

Mary E. Quinn, 200 Mammoth Road, Pelham, N.H.

Filed Feb. 18, 1971, Ser. No. 116,457
Int. Cl. B05b *15/04*
U.S. Cl. 118—505 3 Claims

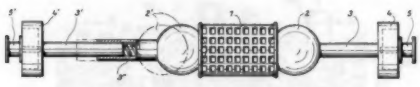


A unitary strippable stencil having an upper layer of thin, flexible, sheet material raised to a substantial height, above the surface to be stencilled by a relatively thick, resilient, compressible, distortable lower layer, which accommodates itself to a rough, or ribbed, surface. Those letters and numerals which have islands, have the islands connected by integral, narrow "bridges" at stencil height so that paint spray may pass thereunder. The stencil includes integral, down-turned flanges encompassing the upper part of the high walls of the compressible layer and includes a pressure sensitive adhesive coating which holds the underface of the thick resilient lower layer in place. The resilient layer may be a polymeric foam.

3,724,421
APPARATUS FOR FLOCKING CYLINDRICAL BODIES

Waldemar Schneck, Neckartenzlingen, and Dieter Huttenlocher, Koengen, both of Germany, assignors to Walter Huttenlocher, Kongen-Esslinger, Germany

Filed Feb. 3, 1971, Ser. No. 112,369
Int. Cl. B05b *5/02*
U.S. Cl. 118—630 **3 Claims**

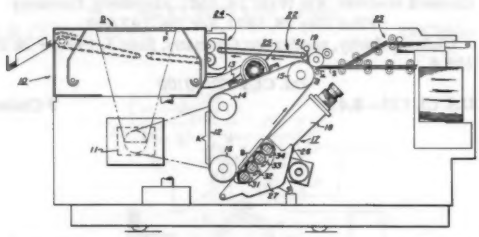


Plastic hair rollers are flocked on automatic machinery in which they are fastened to a conveyor for movement therewith and for rotation about their axes which are at right angles to the direction of conveyor movement. The rollers are dipped in a cleaning liquid in a first processing station, dried by evaporation of the liquid in a second, coated with adhesive composition in a third station, exposed to a stream of fibers moving in an electrostatic field at a fourth station, and the adhesive is cured at a fifth station, whereupon excess fibers are brushed off and the rollers are taken from the conveyor. They are rotated about their axes in most of the processing steps by rolling engagement of a supporting ball bearing on the conveyor with a drive belt or a stationary rail.

3,724,422
MAGNETIC BRUSH DEVELOPING APPARATUS

Salvatore Latone, Rochester, and Michael R. Stanley, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1970, Ser. No. 97,856
Int. Cl. G03g *13/00*; **B05b** *5/02*
U.S. Cl. 118—637 **5 Claims**



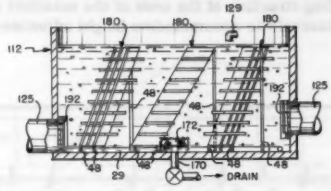
A magnetic brush developing apparatus for use in an electrostatic printing machine having a plurality of brushes arranged with their axes in parallel and in a plane inclined relative to the horizontal and at such an angle as to allow gravitational forces to return the developing material to a point wherein the magnets associated with the brushes may continuously form bristles thereon.

3,724,423
APPARATUS FOR GROWING CRUSTACEANS

John J. Day, and Paul S. Hirschman, both of Fort Lauderdale, Fla., assignors to Ocean Protein Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 887,819, Dec. 4, 1964, Pat. No. 3,658,034. This application Dec. 8, 1970, Ser. No. 96,137. The portion of the term of this patent subsequent to April 25, 1989, has been disclaimed.
Int. Cl. A01k *61/00*
U.S. Cl. 119—4 **10 Claims**

Apparatus and method for providing optimum conditions for the growth and maturation of crustaceans during the post-larval period. A series of interconnecting tanks is provided. Habitats are positioned in each growing tank to promote the growth of the post-larval crustaceans, the type of habitat in a tank being provided to accommodate different size animals.

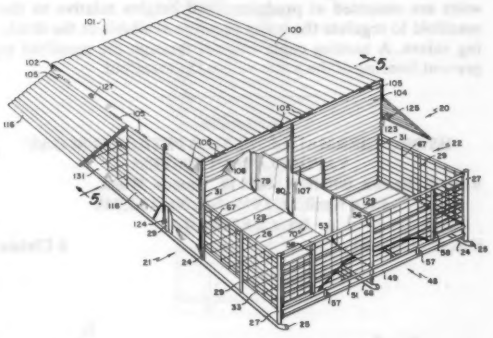


The water environment in each tank is continuously changed to remove waste materials from the tank, thereby promoting growth of the crustaceans. The temperature of the water environment is also maintained at an optimum level to further such growth.

3,724,424
PORTABLE KNOCK-DOWN ANIMAL ENCLOSURE

Marshall E. Benjamin, P.O. Box 727, Amarillo, Tex.

Filed April 30, 1971, Ser. No. 138,877
Int. Cl. A01k *01/02*
U.S. Cl. 119—16 **5 Claims**



A structure for raising animals such as pigs with the animal completely out of contact with the ground. The enclosure is portable with the base forming a skid to permit the enclosure to be moved by dragging it with a tractor or other vehicle over the ground. The floor is completely removeable for replacement when sterilizing the structure after marketing one group of animals and before placing the next group in the enclosure. The enclosure is erected from prefabricated sections which can be shipped flat. The structure can be disassembled for additional shipment when required. Hinged covers are provided for the sides of the structure to serve as an awning in summer and to be dropped tight to the sides of the structure for warmth in winter.

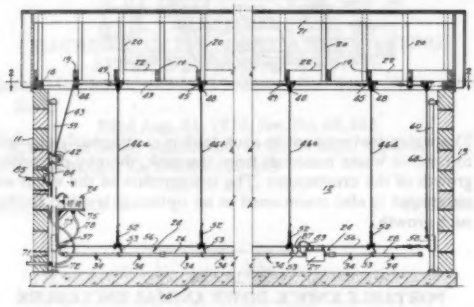
3,724,425
WATER DISTRIBUTION SYSTEM FOR POULTRY AND SMALL ANIMALS

Earl Clayton Thompson, Route 2, P.O. Box 453, Waco, Tex.

Filed May 20, 1970, Ser. No. 39,107
Int. Cl. A01k *07/00*
U.S. Cl. 119—72 **2 Claims**

For providing a supply of drinking water to growing poultry and small animals, a manifold conduit or pipe adjustably supported in spaced relation to the floor of a building, such as a poultry house. The manifold is supported from the roof struc-

ture of the building by a cable system including a winch for selectively adjusting the height of the manifold. A stabilizer system to prevent lateral movement of the manifold includes a cable extending in close parallel relation thereto and being coupled thereto at spaced intervals, the cable being anchored to the building structure at the ends of the manifold to move vertically therewith to accommodate height adjustments. The



manifold includes spaced nibbler valves which are actuated by the animals seeking water to discharge water from the manifold according to demand. Float valve actuated reservoirs are mounted at predetermined heights relative to the manifold to regulate the water pressure available at the drinking valves. A heating cable extends through the manifold to prevent freezing of the water within the manifold.

3,724,426

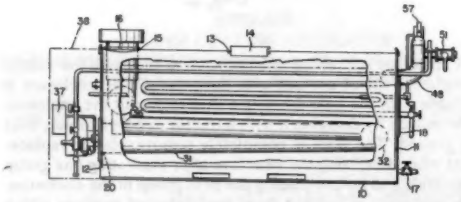
HYDROTHERMAL LIQUEFIED PETROLEUM GAS VAPORIZATION SYSTEM

Verle H. Brown, 800 N.W. 46th St., Seattle, Wash.

Filed April 14, 1971, Ser. No. 133,940

Int. Cl. F22b *1/16*

U.S. Cl. 122—33 **6 Claims**



A hydrothermal, indirect fired liquid petroleum gas vaporization system employed as a stand-by liquefied petroleum gas unit utilizes a forced draft power burner firing into a multiple pass gas fire tube immersed in a heat exchange liquid and isolated from a vaporization assembly through which liquefied petroleum gas is passed. A vaporization assembly for vaporizing the liquefied petroleum gas insures low gas velocities and delivery of dry gas vapor and eliminates liquid gas carryover. The liquefied gas from storage enters a manifold and is distributed into multiple heat exchange tubes immersed in the heat exchange liquid. The liquefied gas vaporizes during passage through the heat exchange tubes and passes into a vapor header and vapor outlet riser, all designed to prevent any liquid gas carryover.

3,724,427

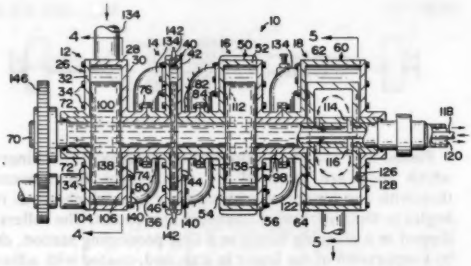
ROTARY INTERNAL COMBUSTION ENGINE

Kenneth D. Sauder, 1861 Brentwood Drive, Clearwater, Fla.

Continuation-in-part of Ser. No. 883,728, Dec. 10, 1969, abandoned. This application June 15, 1971, Ser. No. 153,435

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.07 **9 Claims**



A rotary internal combustion engine including a plurality of segregated chambers arranged in communicating relation with one another such that compression, combustion and expansion of the gases used to rotate the engine may take place in succession, step-like manner. Each of the chambers have mounted therein a rotary pump which may be in the form of a pair of multi-lobed intermeshing rotors mounted on two parallel drive shafts. Alternately, the rotary pumps may be in the form of a single rotor mounted on a single drive shaft which extends through each of the successively arranged chambers so as to position the rotor in movable working relation with the interior of the cylinder.

3,724,428

ROTARY PISTON ENGINE

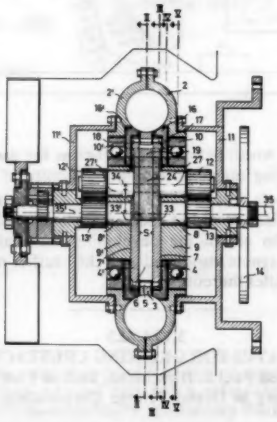
Gerhard Mederer, Am Wehr 14, 8501 Allersberg, Germany

Filed May 28, 1971, Ser. No. 147,899

Claims priority, application Germany, June 3, 1970, P 20 27 109.4

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.47 **3 Claims**

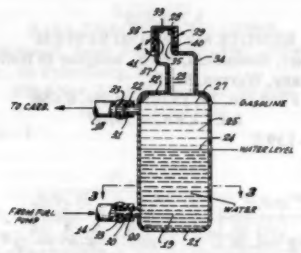


A rotary piston engine comprises an annular circular-sectioned cylinder, a working piston and a contra-piston both part annular and circular-sectioned and both mounted for rotation in said cylinder, a chamber defined in said cylinder, between said pistons constituting a working chamber of the engine and undergoing cycle changes in volume during rotation of said pistons.

3,724,429
POLLUTION-REDUCING FUEL FILTER

Norfleet Tomlinson, 6433 West 82nd Street, Los Angeles, Calif.

Filed Nov. 16, 1970, Ser. No. 90,201
Int. Cl. F02d 19/00, 47/00
U.S. Cl. 123—25 R 4 Claims

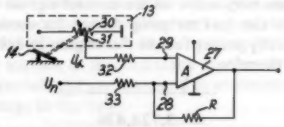


A one-piece plastic bottle having an inlet adjacent its lower end receiving gasoline from a fuel pump, an outlet below its upper end passing gasoline to a carburetor, a layer of water mixed with soluble oil below the outlet, and a sealed compartment for captive air above the outlet so that gasoline bubbles through the mixture, forms a layer thereon, and is cushioned from above by captive air under pressure. A refill opening on the upper end of the bottle is closed by a cap frictionally anchored in place by an O-ring seal.

3,724,430
FUEL INJECTION REGULATOR FOR INTERNAL COMBUSTION ENGINES

Karl-Heinz Adler, Leonberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 15, 1969, Ser. No. 866,521
Int. Cl. F02b 3/00, 33/00
U.S. Cl. 123—32 EA 19 Claims



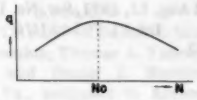
A regulating arrangement for internal combustion engines, particularly of the diesel-engine type. The fuel injection pump is set and displaced through an amplifier having one signal input derived from a speed sensor coupled to the crank shaft of the engine. The input of amplifier may also be fed with a signal derived from the accelerating pedal of the engine. A hydraulic displacement device between the output of the amplifier and the fuel injection pump converts the electrical signal from the amplifier into a corresponding setting of the pump. The feedback network of the amplifier is such that the amplification of the amplifier is substantially high at idling speeds of the engine.

3,724,431
ELECTROMAGNETIC FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

Takashi Inoue; Takao Masuda, and Takeshi Harada, all of Higashi-Matsuyama, Japan, assignors to Diesel Kike Kabushiki Kaisha, Tokyo, Japan

Filed July 13, 1970, Ser. No. 54,228
Int. Cl. F02d 5/02
U.S. Cl. 123—32 EA 4 Claims

An electromagnetic fuel injection device for internal combustion engines comprising electric circuit so arranged that the number of cylinders which undergo simultaneous injection in one cycle of the engine is lessened at low rotational speeds where the control time of the amount of fuel injected is relatively long so as to operate all the fuel injection valves through

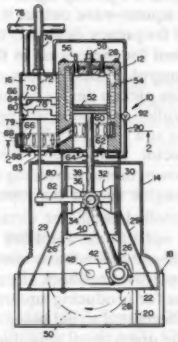


several stages thereby the period of each fuel injection will not correspond to an overlapping period, while for high speed rotation the number of cylinders related to simultaneous injection is increased to equivalently extend said control time.

3,724,432
NONPOLLUTING ENGINE

Tonnes K. Tonnessen, 645 46th Street, Brooklyn, N.Y.

Filed June 3, 1971, Ser. No. 149,439
Int. Cl. F02b 33/12
U.S. Cl. 123—74 R 10 Claims



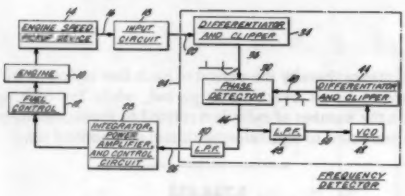
An improved nonpolluting low-emission two cycle diesel crosshead engine designed for the control of air pollution. The engine has a combustion cylinder adapted to slidably accommodate a reciprocating piston. An upper end of the cylinder is provided with a conventional exhaust valve and a fuel injection nozzle. A plurality of apertures defined in a lower end of the cylinder interconnect the cylinder with an independent air chamber. The air chamber has a fluid pump providing an expansible interior volume to accommodate clean air displaced from the cylinder on the power stroke of the piston. A floating pump piston in the air chamber is urged toward a lower end of the chamber to intermittently force a clean, relatively cool charge of air into the cylinder for scavenging the smoke, particulates, fumes and other exhaust emissions and for supplying a clean air charge for compression. A piston lifter is adapted to return the pump piston to its initial position during the compression stroke of the piston; simultaneously, suction valves open to admit cooled and/or filtered air at atmospheric pressure into the air chamber and cylinder. A valve bypass conduit connects the cylinder and the independent air chamber to provide means for regulating the air pressure acting on the floating pump piston and to thus adjust the movement for particular operating conditions of the engine. In a modified embodiment, the independent air chamber is placed concentrically around the cylinder and is provided with a circular pump piston and piston lifter ring.

3,724,433

ENGINE GOVERNOR SYSTEM WITH SIGNAL-LOSS PROTECTION AND CONTROLLED OSCILLATOR CIRCUIT SUITABLE FOR USE THEREIN

James R. Voss, Wilbraham, and William R. Ferry, Agawam, both of Mass., assignors to Ambac Industries, Incorporated, Springfield, Mass.

Filed Aug. 13, 1971, Ser. No. 171,504
Int. Cl. F02d 11/10
U.S. Cl. 123—102 9 Claims



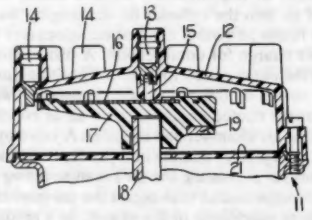
A controlled oscillator circuit which, in the absence of an input alternating signal, operates in a free-running manner to produce square-wave output signals at a predetermined frequency, and which responds to input alternating signals of a lower frequency to produce output square-waves at said lower frequency. When used in an engine-speed control system, the input alternating signal is a pickup signal representative of engine speed, and the square-wave output is applied to a phase-locked-loop type of frequency detector, the output of which varies the fuel control for the engine in the sense to accomplish the desired control. Should a loss of input alternating signal from the engine pickup device occur while the engine is operating, the controlled oscillator will nevertheless produce output square waves at a relatively high frequency to operate the frequency detector and reduce the engine power or completely shut it down, thereby avoiding erratic operation or "runaway" of the engine should the input alternating signal disappear. The controlled oscillator circuit preferably comprises a differential operational amplifier having a relatively long time-constant negative-feedback circuit and a relatively short time-constant positive feedback circuit providing two alternate astable states for producing square waves during free running, the input alternating signal being applied to a control input electrode of the operational amplifier to cause it to stay in each of its alternate astable states for a time equal to about one-half cycle of the input wave and to operate in synchronism with the input alternating signal.

3,724,434

FUEL INJECTION SYSTEMS

John Longstaff-Tyrrell, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 7, 1970, Ser. No. 95,621
Claims priority, application Great Britain, Dec. 17, 1969, 61,435/69
Int. Cl. F02p 5/04, 7/02
U.S. Cl. 123—117 R 4 Claims



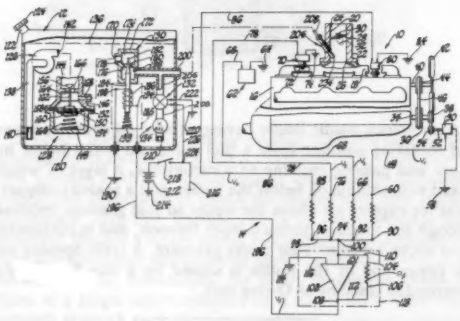
A fuel injection system for use with a multi-cylinder engine of the kind employing an ignition distributor includes a permanent magnet carried by a part of the distributor which rotates with the distributor shaft in use, and a plurality of magnetically operable switches positioned within the casing of the distributor adjacent the locus of movement of the permanent magnet. The switches are operated by the magnet in turn as the distributor shaft rotates and serve to control operation of means for supplying fuel to the cylinders of the engine.

3,724,435

REMOTE METERING SYSTEM

Kenneth C. Bier, Bloomfield, Mich., assignor to Holley Carburetor Company, Warren, Mich.

Filed Jan. 29, 1970, Ser. No. 6,656
Int. Cl. F02m 39/00
U.S. Cl. 123—139 E 1 Claim



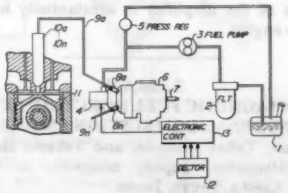
An internal combustion engine and a fuel supply tank, located remote to the engine, are provided with transducers sensitive and responsive to parameters of engine speed, engine intake manifold pressure, engine temperature and ambient temperature for providing control signals in accordance with such parameters; a fuel supply pump, pressure regulator and fuel metering device are situated within the fuel tank and connected by conduit means to a fuel discharge valve situated for discharging metered fuel to the engine induction passage; and control means responsive to the control signals is operatively connected to the fuel metering device for control thereof in order to thereby meter fuel to the engine in accordance with the demand therefor.

3,724,436

FUEL FEED CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINES

Senichi Nagata, Nagoya; Oyuki Ogawa, Kariya, and Nobuhito Hobo, Inuyana, all of Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan

Filed March 23, 1971, Ser. No. 127,203
Claims priority, application Japan, April 2, 1970, 45/28031
Int. Cl. F02m 51/00
U.S. Cl. 123—139 E 1 Claim



A fuel feed control device for internal combustion engines, having a fuel supply source for supplying fuel at an optional predetermined pressure and a fuel injection pump for feeding

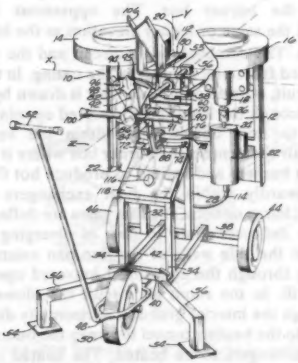
the pressurized fuel to fuel injection valves mounted in an engine, and further having a valve disposed directly in the pump chamber of said pump in communication with said fuel supply source and opened and closed by electric signals, the quantity of fuel discharged from said fuel injection pump and the period of discharge being regulated by controlling the current conducting time and current conducting period to said valve.

3,724,437

BALL THROWING MACHINE

Earle W. Halstead, Saint Petersburg, Fla., assignor to Tru-Pitch, Inc., St. Petersburg, Fla.

Filed Nov. 23, 1970, Ser. No. 92,080
Int. Cl. F41b *15/00*
U.S. Cl. 124—1 **6 Claims**



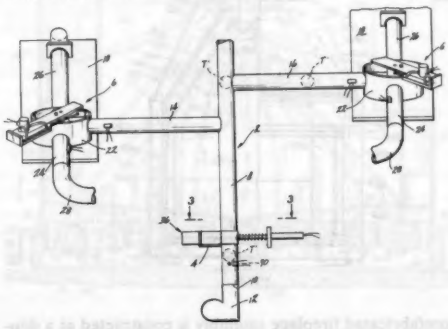
A ball is introduced on a track into the nip between two counter-rotating wheels which throw the ball. Separate variable speed motors drive the wheels and control the speed of the thrown ball and, as a result of the relative speeds of the wheels, impart a spin to the ball to produce a curve, slider, etc. A control system is arranged to automatically and repeatably select the relative speeds of the motors to provide the type and/or speed of the pitch desired. A universal joint arrangement allows pivotal movement of the wheel supporting structure about three axes for controlling and repeatably selecting the direction of the thrown ball. Ball-engaging portions of the wheels and the surface of the ball track are constructed from low friction materials and are arranged to minimize discoloration of and damage to the ball.

3,724,438

TARGET LAUNCHER

William L. Brandt, Lebanon, Mo., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 19, 1971, Ser. No. 116,866
Int. Cl. F41f *1/04*
U.S. Cl. 124—11 R **5 Claims**



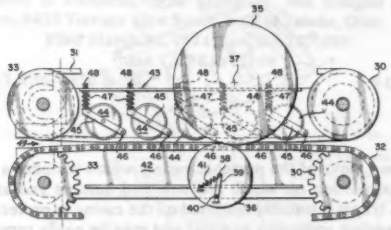
Apparatus for launching spherical targets into the air including a tubular pneumatic conveyor system having a main trunk portion and branch portions. A transfer mechanism is connected to a remote end of each of the branch portions of the conveyor to receive a target from the conveyor and deposit the targets is a pneumatically actuated launching tube. Targets are thus fed from a source through the conveyor and into the launching tubes to be propelled into the air.

3,724,439

APPARATUS FOR TRIMMING SLATE

Robert G. Cabell, Colombia; Thomas A. Yancey, Arvonia; Roy Norman Linville, and Daniel J. Harrington, both of Richmond, all of Va., assignors to Arvonia-Buckingham Slate Company, Inc., Arvonia, Va.

Filed Dec. 15, 1967, Ser. No. 691,059
Int. Cl. B28d *1/32*
U.S. Cl. 125—23 T **11 Claims**



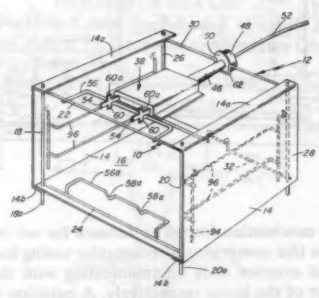
A trimming apparatus for slate blanks wherein two opposing circular wheels are used to trim the blanks and at the same time accommodate warpage and irregularities in the blanks in order to furnish high production with relatively small breakage.

3,724,440

PORTABLE OVEN

Robert A. Clark, Allentown, and Peter L. Helgeson, Macungie, both of Pa., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 25, 1972, Ser. No. 229,423
Int. Cl. F24c *1/16*; A47j *37/07*
U.S. Cl. 126—9 R **6 Claims**



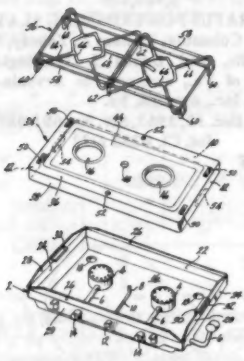
A portable gas or electric oven comprising a wire framework which is easily assembled and disassembled and which embodies means for efficiently supporting a burner in position for broiling or baking of foods supported in the oven, and which further embodies rigid wall portions and, if desired, a disposable wall covering which may be utilized during actual cooking processes and thereafter discarded, and which may be eliminated entirely for oven demonstration purposes.

3,724,441

CAMP STOVE TRAY TO CASE MOUNT

Carl E. Finley, Sycamore, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 25, 1971, Ser. No. 174,728
Int. Cl. F24c 5/20
U.S. Cl. 126—38 3 Claims



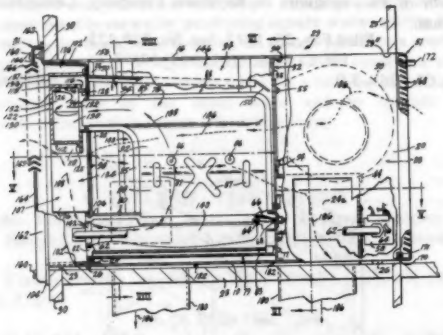
A camp stove of the portable variety which includes a casing basal portion on which are mounted burners and an igniter. A tray is releasably mounted on the casing to protect the casing against spattering and dirt and may be easily removed for cleaning. A grill is seated on the tray for supporting cooking utensils over the burners, the grill being easily removed for cleaning.

3,724,442

SEALED COMBUSTION FORCED AIR FURNACE

Chester T. Gurney, and Arnold P. Gatti, both of Fresno, Calif., assignors to Motor Wheel Corporation, Lansing, Mich.

Filed April 13, 1971, Ser. No. 133,632
Int. Cl. F23j 11/00; F24c 3/00; F24h 3/00
U.S. Cl. 126—85 B 34 Claims



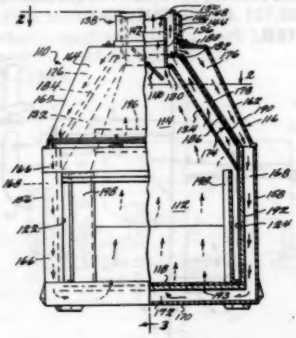
A sealed combustion forced air furnace for use in a mobile home or the like comprising a rectangular casing having open interior and exterior ends communicating with the interior and exterior of the home respectively. A partition within the casing divides the casing into forward and rear compartments and includes a cut-out communicating the two compartments. An interior grill covers the open interior end of the casing and a motor-driven blower within the forward compartment draws room air through the interior grill into the forward compartment and discharges the air through the cut-out into the rear compartment. A pair of vertical side baffles and a top baffle in the rear compartment extending rearwardly from the cut-out define a central air heating tunnel. A rectangular burner box lies vertically below the tunnel and a pair of heat exchangers project upwardly therefrom within the air heating tunnel. A pair of burners are within the burner box below each heat exchanger. A vent pan encloses the open exterior end of the casing by means of an interior upright wall and an exterior grill covers the exterior end of the vent pan to define therewith a ventilation chamber. The burner box communicates with the ventilation chamber, and the heat exchangers have discharge outlets communicating with the ventilation chamber. A flue pan assembly within the ventilation chamber comprises a vertical deflector plate spaced rearwardly opposite the discharge outlets, and a pair of lateral exhaust openings between the upright vent pan wall and the deflector plate. The flue pan assembly further includes a pair of vertical side walls spaced laterally outwardly of and opposite the lateral exhaust openings. The upper portion of the exterior grill has a plurality of louvered openings and an imperforate lower portion in juxtaposition to the burner box. The uppermost louvered openings are at the same or higher elevation as the lateral exhaust openings. The combustion air circuit and the room air circuit are sealed from one another in the casing. In the combustion air circuit, outside combustion air is drawn by natural gravity draft through the lowermost louvered openings in the exterior grill to flow downwardly within the ventilation chamber. The air then enters the burner box where it is mixed with fuel in the burners and ignited to produce hot flue gases which rise upwardly within the heat exchangers to flow through the discharge outlets. The flue gases are deflected and divided by the deflector plate to flow in diverging streams laterally against the side walls of the flue pan assembly and then outwardly through the uppermost louvered openings in the exterior grill. In the room air circuit the blower draws room air through the interior grill and horizontally discharges the room air into the heating tunnel to sweep the outer surface of said heat exchangers to be heated. The heated room air upon exiting from the tunnel is deflected and divided by the upright wall of the vent pan to flow in two streams between each side baffle and the adjacent casing side wall to a plurality of discharge openings in the casing bottom and sides. The furnace controls are located within the forward compartment and are conveniently accessible from the interior of the home by removing the interior grill. The burner box and heat exchangers are rendered accessible for cleaning from the exterior of the home by removing the exterior grill.

3,724,443

COUNTER-FLOW FIREPLACE

Walter C. Carson, Savannah, Ga., assignor to Martin Stamping & Stove Company, Huntsville, Ala.

Continuation-in-part of Ser. No. 846,911, Aug. 1, 1969, Pat. No. 3,601,117. This application Aug. 20, 1971, Ser. No. 173,590
Int. Cl. F24b 7/00
U.S. Cl. 126—121 6 Claims



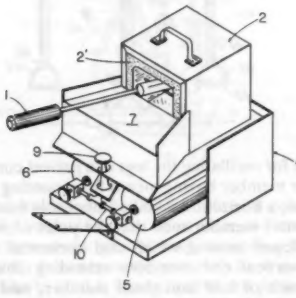
A prefabricated fireplace assembly is constructed as a double-walled structure defining an open-front hearth and a dome

portion terminating at its upper end in a smoke pipe adapted to cooperate with counterflow chimney of the type having concentric ducts for drawing in cooling air and discharging warmed air. A hood-like baffle surrounding the front and sides of the dome portion and disposed in the space between the double walls directs cooling air from the chimney over internal surfaces to be cooled and back to the chimney.

3,724,444
PORTABLE FIRE POT FOR SOLDERING IRON

Paulino G. Varona, 5535 Saint Rock Avenue, New Orleans, La.

Filed Dec. 28, 1970, Ser. No. 101,663
Int. Cl. F24c *3/00*
U.S. Cl. 126—237 4 Claims

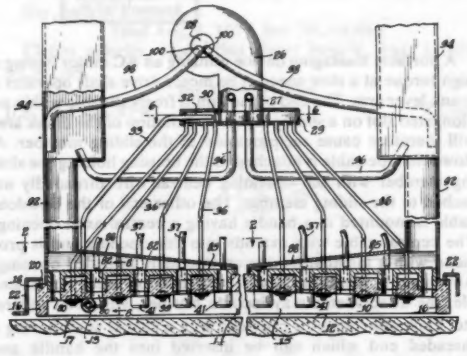


A soldering iron furnace which is light in weight so as to be readily portable, in which the degrees of heat generated is subject to manual control, which provides for rapid and economical heating of the soldering irons, and which confines the flame so as to be safe for use in areas selected for soldering; a dual fuel supply with a common T-joint connection is provided thereby adding much flexibility to the refill timing and allowing use of the device while one-half of the fuel supply is being replenished.

3,724,445
HEATER FOR ASPHALT CONCRETE ROADWAYS AND THE LIKE

Earl F. Cutler, Lawrence, Kans., assignor to Cutler Repaving Inc., Lawrence, Kans.

Filed March 30, 1971, Ser. No. 129,404
Int. Cl. E01c *23/14*
U.S. Cl. 126—271.2 A 11 Claims

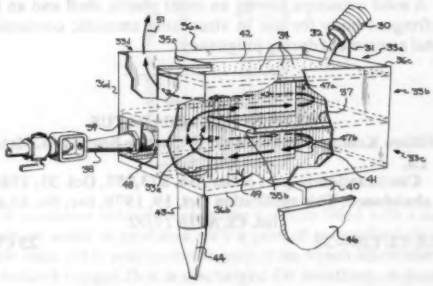


Fuel such as pentane is heated to 300° F to 400° F and then mixed with the air needed to oxidize the carbon and produce a smokeless exhaust. The mixture is delivered into a shallow chamber of which the pavement to be heated is the bottom. The roof of the chamber is of infra-red brick and has depending side walls and end walls extending down close to the pavement to be heated, providing heat-radiating surfaces. The spent gases are aspirated through holes in the roof near its edges to keep the pressure in the chamber automatically identical with the atmospheric pressure outside. The intensity and rapidity of the heat transfer into the roadbed is such that exposure to the naked flame in the chamber can only be continued for a fraction of a minute without getting the surface hot enough to injure the pavement. The completion of the process is as disclosed in my earlier U.S. Pat. No. 3,361,042 and includes roweling all the softened roadbed to dislodge heated material and additional cooler material lower down, and a second heating of the roweled surface.

3,724,446
SWIMMING POOL HEATER

Raymond S. Richards, 2755 Sagamore, and Douglas F. St. John, 4433 Terrace View South, both of Toledo, Ohio

Filed March 24, 1971, Ser. No. 127,499
Int. Cl. F24h *1/10*
U.S. Cl. 126—350 R 8 Claims

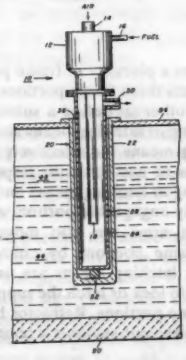


There is disclosed a direct contact, water-nonsubmerged system for heating of a swimming pool by the transverse flowing of water into direct contact with a flowing heat source. In the specific practice, a source of swimming pool water is flowed onto a water dispersing surface containing a multiplicity of weep holes and then flowed through the weep holes into aheat source flowing transverse to the water flow through the weep holes.

3,724,447
IMMERSION HEATER

Vernon E. Parkhill, Lower Burrell, and Marshall J. Bruno, Greensburg, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 27, 1971, Ser. No. 193,113
Int. Cl. F24h *9/18*
U.S. Cl. 126—360 R 9 Claims



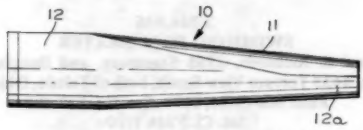
An improved immersion heater assembly for heating baths containing molten aluminum or magnesium and salt flux fea-

tures an outer refractory jacket and an inner metal liner. The improved assembly offers resistance to both the salt and the corrosive aluminum providing extended heater life.

3,724,448
SOLID OVOSCOPE

Jorge Rodrigues Lima, Av. N.S. de Copacabana 342, Apt. 403, Rio de Janeiro, Brazil

Filed Oct. 16, 1970, Ser. No. 81,307
Int. Cl. A61b 1/00
U.S. Cl. 128—6 2 Claims

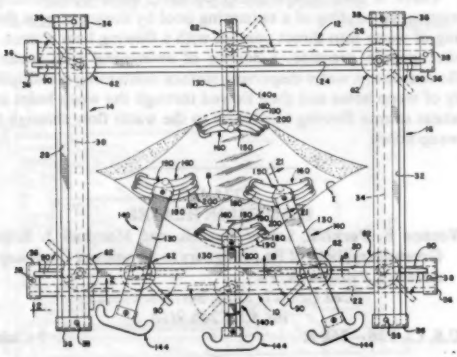


A solid ovoscope having an outer plastic shell and an inner refringent body for use in visualizing amniotic contents and fetal assessment during pregnancy.

3,724,449
RETRACTOR APPARATUS

William Kohlmann Gauthier, 310 Codifer Boulevard, Metairie, La.

Continuation-in-part of Ser. No. 873,051, Oct. 31, 1969, abandoned. This application Oct. 19, 1970, Ser. No. 81,651
Int. Cl. A61b 17/02
U.S. Cl. 128—20 23 Claims

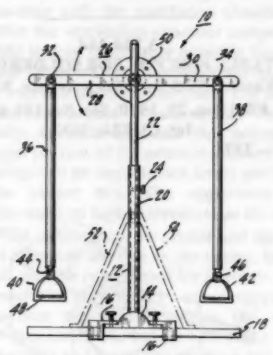


A frame includes a plurality of frame portions. Connecting means interconnects these frame portions for movement with respect to one another to define a substantially rectangular framework. Locking or latching means is associated with each of said connecting means for selectively locking or latching the frame portions in position with respect to one another, each of said locking or latching means including an outwardly extending manually engageable portion which can be readily operated. Support arms are also movably mounted with respect to the frame portions by connecting means, and similar locking or latching means are associated with such connecting means to lock or latch the support arms in position relative to the frame portions. Retractor blade means including a plurality of telescopic sections is connected to one end of the support arms.

3,724,450
LIMB OSCILLATOR

Horace Chaitin, 6 Peppermill Road, Roslyn, N.Y.

Filed May 5, 1971, Ser. No. 140,337
Int. Cl. A61h 1/02
U.S. Cl. 128—25 R 13 Claims

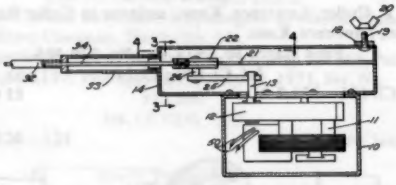


A device for oscillating the legs of a patient comprises a vertical center member having means for mounting said member upon a base, a horizontal member moveably mounted on said vertical center member such that the point of mounting provides a fulcrum around which said horizontal member can oscillate, vertical end members extending downward from near the ends of said horizontal member, said vertical end members being provided with stirrups for supporting the feet of the patient and means for oscillating said horizontal member about said fulcrum, thereby alternately raising and lowering the legs supported by the stirrups.

3,724,451
PORTABLE MASSAGING DEVICE

Don Santo, 1440 N. 64th Way, Hollywood, Fla.

Filed July 12, 1971, Ser. No. 161,782
Int. Cl. A61h 7/00
U.S. Cl. 128—52 8 Claims



A portable massaging device utilizing an AC motor having a high torque at a slow speed. The motor drive shaft operates a crank lever arm. The end of the arm is freely slidable within an elongated slot on a sliding member. Rotation of the crank arm will therefore cause reciprocation of the sliding member. A Bowdoin type cable is attached to the housing holding the sliding member with the operating central wire threadedly attached to the sliding member. The other end of the Bowdoin cable is mounted in a handle having a central axial opening. The central cable wire extends into this opening and is provided with a member having an internally threaded opening. Any suitable massaging attachment may be used. For example, the attachments may include brushes, vibrators, rollers, etc. Each attachment is provided with a carrier shaft having a threaded end which can be inserted into the handle and threaded into the member at the end of the central wire of the cable. With this hook-up, when the motor is turned on, the crank arm causes reciprocation of the sliding member. This

causes the central cable wire to reciprocate so that its end will reciprocate within the axial handle opening. If the handle is grasped manually, the attachment will also reciprocate and can be applied to a suitable portion of the body.

3,724,452
CERVICAL BRACE

Robert O. Nitschke, Rochester, N.Y., assignor to Ted J. Green, Costa Mesa, Calif.

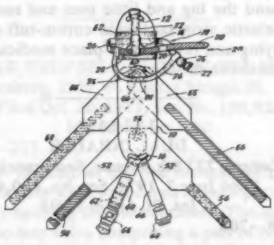
Filed March 4, 1971, Ser. No. 120,871
Int. Cl. A61h 1/02
U.S. Cl. 128—75 **15 Claims**

A cervical brace includes a chest plate, a pair of shoulder bars pivotally mounted on the chest plate and resting on a patient's shoulders, and a pair of straps extending from the ends of the shoulder bars across the patient's back and secured to the chest plate to hold it firmly against the patient's sternum. A chin support is held under the patient's chin by an elongated chin support bar having vertically spaced apart holes, one of the holes being fitted over a pin on the chest plate. A hinged plate on the chest plate pivots over the chin support bar to hold it on the pin. The plate may be swung aside to remove the chin support from the chest plate and later replace it at the proper elevation under the patient's chin without moving the patient's head. An occipital support is held under the patient's occiput by an occipital support bar which extends over the patient's shoulders and is secured to the chest plate. An adjustable stop on each side of the occipital support bar fits into a respective slot on the chest plate, each stop being held in its slot by a respective hinged plate on the chest plate. When the hinged plates are swung aside the occipital support may be applied to the patient's occiput without substantial movement of the patient's head, neck, or upper torso.

3,724,453
SPLINTS

Amers Ernest Dixon, 44 Sutton Street, Walkergate, Newcastle upon Tyne, and Michael Proctor, 27 Beach Avenue, Whitley Bay, both of England

Filed Aug. 4, 1970, Ser. No. 60,840
Claims priority, application Great Britain, Aug. 6, 1969, 39,341/69
Int. Cl. A61f 5/04
U.S. Cl. 128—87 R **4 Claims**

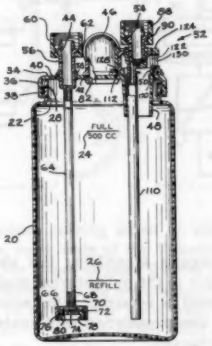


A splint which is of particular value in extricating persons from vehicle crashes where an injury of the spine or neck is to be feared comprises a solid backing member which is of a length to stretch from adjacent the bottom of the spine to behind the head of an injured person, and which has secured thereto a harness for holding the head in position against the splint and further harness for rigidly securing the torso to the splint (which harness may also hold the arms rigidly).

3,724,454
HUMIDIFIER - NEBULIZER

Joseph W. Brown, Chicago, Ill., assignor to The Bendix Corporation, South Bend, Ind.

Filed Feb. 4, 1971, Ser. No. 112,523
Int. Cl. A61m 11/00
U.S. Cl. 128—194 **1 Claim**



A container defining a chamber partially filled with a liquid such as water is provided with a pair of pressurized oxygen flow inlet ports and an outlet port from which humidified or nebulized oxygen flow is discharged for breathing. A humidifying device connected to one of the inlet ports includes a diffuser immersed in the water and provided with relatively small slots through which pressurized oxygen is forced to form minute bubbles that rise through the water to provide humidified oxygen flow which passes out of the outlet port. A nebulizing device connected to the second inlet port includes a tube having one end extending into the water and an opposite end exposed to a low pressure region generated by high velocity oxygen flow through an orifice. Water thereby aspirated through the tube is broken up and entrained by the oxygen flow and the resulting mixture discharged into an enlarged volume chamber and directed against a fixed pin or baffle in the chamber to further break up the entrained water particles. An adjustable inlet port communicates the chamber with room or ambient air to provide preselected dilution of the nebulized oxygen flow with room air which room air is aspirated into the chamber by sub-atmospheric pressure generated therein. The diluted nebulized oxygen flow subsequently passes out of the outlet port. The humidifying and nebulizing devices are independently operatively depending upon which one of the pair of inlet ports is connected to a suitable pressurized oxygen source.

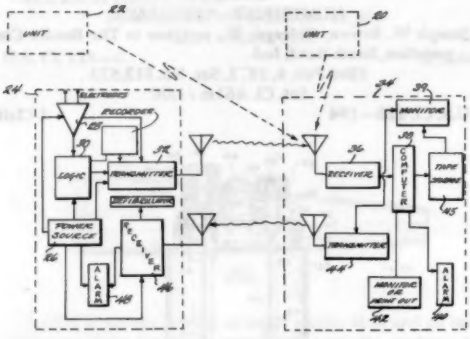
3,724,455
CARDIAC WARNING DEVICE

Paul N. Unger, 945 Arthur Godfrey Road, Miami Beach, Fla.

Filed June 2, 1970, Ser. No. 42,850
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 A **10 Claims**

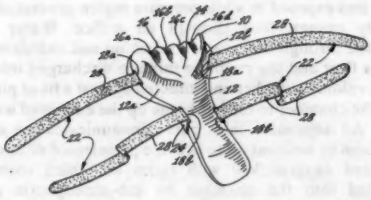
A method and apparatus for detecting and responding to herald signs in the cardiac waveform, such as a fast heartbeat rate, a low rate or a skipped heartbeat. In one embodiment the detection of a herald sign causes the ECG waveform to be transmitted to a remote location where it is analyzed and a signal retransmitted to the patient triggering an alarm or causing other appropriate action. In another embodiment, the detection of a herald sign causes the ECG to be recorded on a

loop of magnetic tape or a modular solid state memory device in the unit so that the tape can be replayed and acoustically coupled to the telephone line after the patient calls the central facility. In yet another embodiment, the detection of different herald signs causes different alarm signals, e.g., colored lights,



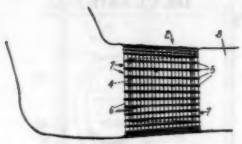
different alarm signals identifying the abnormality, to be operated to indicate to the patient what medication he should administer to himself or whatever other action he should take in the event that communication with central facility cannot be immediately achieved.

3,724,456
EXTREMITY SUPPORT ATTACHMENT FOR INTRAVENOUS FEEDING
Rudy Waxman, 17132 Killion St., Encino, Calif.
Filed May 5, 1971, Ser. No. 140,458
Int. Cl. A61m *05/00*
U.S. Cl. 128—133 **10 Claims**



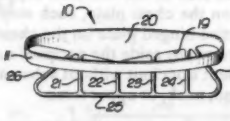
A device to support a human extremity, such as a hand or foot and to be secured thereto, having among other uses intravenous (i.v.) feeding and blood transfusion, the device including a member of a rigid material contoured to hold comfortably and in an anatomically correct position one of such extremities when the member is laid upon a horizontal surface. A disposable liner of sterilized resilient cellular material is placed directly upon the contoured area of the member and is folded over the extremity after the i.v. needle has been properly inserted in the patient's vein and the extremity is disposed therein. Straps having prickly inner surfaces are provided to be wrapped over the exposed area of the thus-folded cellular liner to secure the extremity to the contoured device and the i.v. needle to the patient's extremity. Locking means may also be employed to prevent a patient from attempting to remove the straps.

3,724,457
BANDAGING MEANS
Ernst Karel Klatte, 9 Noolseweg, Laren, Netherlands
Filed Nov. 17, 1970, Ser. No. 90,372
Claims priority, application Great Britain, Nov. 20, 1969, 56,829/69
Int. Cl. A61f *13/00*
U.S. Cl. 128—171 **5 Claims**



A bandaging means for retaining dressings in place comprises a tubular fabric of special open mesh structure. Row of chain stitches made from non-elastic yarn extend in axial direction of the fabric, and elastic yarns are each arranged in reciprocating fashion between two successive rows of chain stitches and linked therewith so as to form between those two rows of chain stitches, on tensioning of the fabric, a line of trapeziums alternately inverted in relation to each other. The two parallel sides of each trapezium are formed by the rows of chain stitches and the other two sides are formed by the elastic yarn.

3,724,458
TOE HARNESS
Tracy D. Piper, 7900 Teesdale Avenue, North Hollywood, Calif.
Filed Nov. 2, 1970, Ser. No. 86,113
Int. Cl. A61f *13/00*
U.S. Cl. 128—171 **3 Claims**

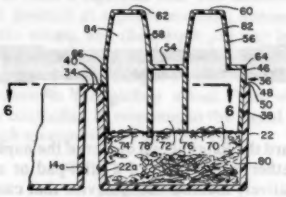


An elastic band of a suitable length to contract about the foot just behind the toes to retain itself in place, this band having cottonstuff-retaining elastic strips secured to its forward edge at points located above the foot and aligned with vertical planes in which the toes are contiguous, said elastic strips extending downward between said toes and being connected at their lower ends by a transverse elastic strip, the opposite ends of said transverse strip being connected with the front edge of said band by wing elastic strips which pass outwardly and upwardly around the big and little toes and serve to keep said transverse elastic strip taut, said cotton-tuft-retaining elastic strips overlying and retaining in place medicated tufts of cotton placed between the toes.

3,724,459
DUAL INHALER
Peter Leo Congro, 222 8th Avenue, San Francisco, Calif.
Filed June 7, 1971, Ser. No. 150,499
Int. Cl. A61m *15/08*
U.S. Cl. 128—200 **4 Claims**

A two piece nasal inhaler comprising an integral case with a cover hingedly joined and an insert for said case with two nos-

tril shaped protuberances mounted on a housing with a channel extending through the protuberances and communicating



with said housing. An air passage is provided to permit the flow of air through the housing and up through the protuberances.

3,724,460

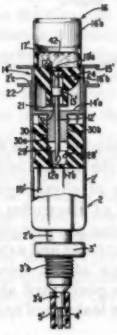
DISPOSABLE CARTRIDGE FOR ADMIXING TWO COMPONENTS OF INJECTABLE MEDICAMENT

Eloy A. Gomez, West Chester; Stephen W. Goodsir, King of Prussia, and Dominic A. Marrocco, Chester, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 775,726, Nov. 14, 1968, Pat. No. 3,636,950. This application Jan. 28, 1971, Ser. No. 110,433

Int. Cl. A61m *5/00*

U.S. Cl. 128—218 M 8 Claims



A cartridge unit for use in, or as a syringe, and comprising two chambers, each for containing a separate component of the final injectable mixture, wherein one of the chambers is detachably mounted on the unit, the other chamber is provided in the unit, and a double-pointed cannula is provided for communicating the two chambers and then causing the contents of the removable chamber to be introduced into the other chamber, whereafter the detachable chamber is removed to permit attachment of a push rod to the plunger or stopper when the unit is to be used.

3,724,461

CONTAINER WITH SELF-CLOSING ONE-WAY VALVE

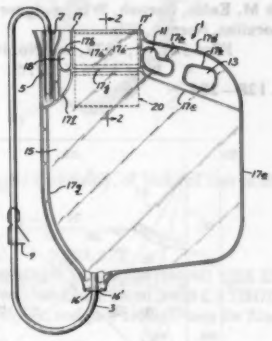
Melvin I. Eisenberg, 2908 W. Lunt, Chicago, Ill.

Filed Oct. 20, 1971, Ser. No. 190,926

Int. Cl. A61m *3/00*

U.S. Cl. 128—227 19 Claims

A container for fluid or the like including a pair of closely confronting flexible walls unsecured along a portion thereof to form a supply opening for the container. The supply opening includes a one-way valve comprising a pair of confronting flat walls of flexible sheet material forming a flattened sleeve-like structure open at the opposite ends thereof and respectively secured to the confronting container walls. An arcuate seal-forming spring member is secured to and extends across the outside of one of the valve walls with the convex side thereof facing the same to draw the valve walls thereto into sealing relation. A pair of oppositely curving partially expanded confronting spring members are located between said valve walls,



the spring members curving about an axis extending in the direction of the open ends of the flattened sleeve-like valve structure, with the concave sides thereof facing one another, so that the confronting spring members can be squeezed to expand the same to balloon the same outwardly together with the valve walls on the outside of the same to form a large inlet passageway into the container.

3,724,462

WATER-DISPERSIBLE INSERTION DEVICES FOR TAMPONS AND THE LIKE

David E. Hanke, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 1, 1971, Ser. No. 194,694

Int. Cl. A61f *15/00*

U.S. Cl. 128—263 8 Claims

Improved water-dispersible insertion devices for tampons, suppositories and the like of the type which comprises a pair of telescoping plastic tubes made from plastic sufficiently sensitive to water to be softened in the presence thereof. One of the tubes is made from a type of water-sensitive plastic material which is different from the material used for the other tube. In addition, the plastic material of one tube is incompatible with the plastic material of the other tube.

3,724,463

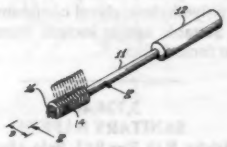
ROTATABLE HYGIENIC VAGINAL SWAB DEVICE

Edward O. Vail, 330 W. Chevy Chase Drive, Apt. No. 33, Glendale, Calif.

Filed Nov. 9, 1970, Ser. No. 87,725

Int. Cl. A61m *35/00*

U.S. Cl. 128—269 4 Claims



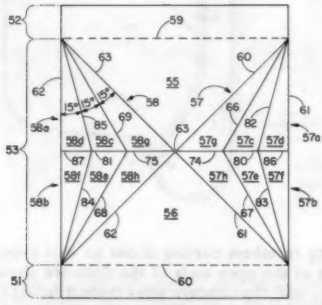
A vaginal swab device for use in cleansing the vaginal canal comprising: an elongated manually rotatable element having a series of adjacent spiral coils of absorbent strands wound thereon adjacent one extremity of said element, one end of

each of said strands secured to said element whereby they may be spirally wound by rotating said element in one direction and unwound by rotating the element in the opposite direction.

3,724,464
PREFOLDED DISPOSABLE DIAPER

Kenneth M. Enloe, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 11, 1971, Ser. No. 105,160
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **4 Claims**

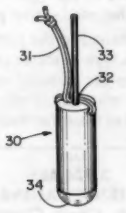


An improved prefolded disposable diaper folded to provide a centrally disposed, downwardly depending, main pocket flanked on each side by laterally disposed secondary pockets.

3,724,465
TAMPON COATED WITH INSERTION AID AND METHOD FOR COATING

David V. Duchane, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed July 22, 1971, Ser. No. 165,134
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 **6 Claims**



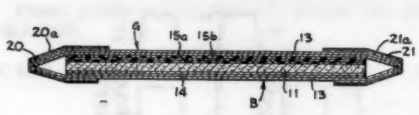
A compressed absorbent tampon provided with an improved insertion-aid coating on at least the tip portion and a method for applying the improved coating and similar coatings to the tampon. The improved coating comprises a normally solid polyethylene glycol containing at least one stabilizing agent. Suitable agents include water-insoluble metal stearates and/or fumed silica.

3,724,466
SANITARY NAPKIN

Laurel A. Hendricks, P.O. Box 943, Palo Alto, Calif.

Filed Nov. 10, 1971, Ser. No. 197,210
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 R **12 Claims**

A sanitary napkin having adhesive peel-off strips at the ends of the napkin for securing the napkin to an undergarment of a wearer. The peel-off strips with a pile or soft plastic surface finish are scored or cut to permit peel-off tabs on the garment side of an absorbent cover for the napkin to be removed by

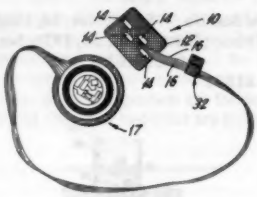


peeling toward the longitudinal center of the napkin. Thus, the napkin, whether in the form of a mini-pad or a regular size pad, is a relatively inconspicuous device that can be attached relatively indiscernibly to the undergarment of the wearer.

3,724,467
ELECTRODE IMPLANT FOR THE NEURO-STIMULATION OF THE SPINAL CORD

Roger E. Avery, Mellville, N.Y., and James G. Wepsic, Jamaica Plains, Mass., assignors to Avery Laboratories, Inc., Farmingdale, N.Y.

Filed April 23, 1971, Ser. No. 136,924
Int. Cl. A61n *1/04*
U.S. Cl. 128—418 **11 Claims**

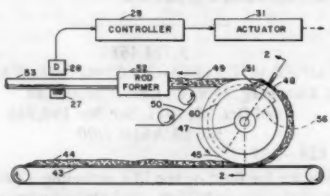


An improved implantable device for electrically stimulating a selected portion of the spinal cord is provided. A relatively thin and flexible strip of physiologically inert plastic is provided with a plurality of electrodes. Lead wires that are also encapsulated in the same physiologically inert plastic material are secured to the electrodes and extend therefrom at approximately the same angle as the spine's posterior process. A packing gland may be positioned about the lead wires to the electrodes to minimize leakage of spinal fluids.

3,724,468
PROCESS CONTROL SYSTEM

Donald E. Varner, Scituate, Mass., assignor to Industrial Nucleonics Corporation

Continuation of Ser. No. 433,932, Feb. 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 85,426, Jan. 27, 1961. This application Aug. 8, 1967, Ser. No. 659,236
Int. Cl. A24c *05/32*
U.S. Cl. 131—21 D **5 Claims**



Specifically disclosed herein is a control system for a cigarette making machine in which a stream of tobacco is

picked up in the peripheral groove of a rotating pickup wheel and held by suction applied through the interior of the wheel while the stream is trimmed by a rotary trimming knife to the size required to form a cigarette rod. The trimming knife occupies a fixed position at a predetermined distance from the periphery of the wheel, and the weight per unit length of the cigarette rod is controlled by automatically adjusting the spacing between a pair of wheel flanges which form the sides of the peripheral groove in the pickup wheel. The width of the groove is thus controlled in response to the signal from a beta ray gauge which measures the cigarette rod.

3,724,469

TOBACCO SMOKE FILTER

Jefferson W. Reynolds, and Cephas H. Sloan, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 23, 1971, Ser. No. 183,223
Int. Cl. A24b *15/02*
U.S. Cl. 131—266 **5 Claims**

Disclosed are cigarette filters containing compositions of certain cobalt or iron chelates adsorbed or supported on the surface of a suitable particulate support such as activated carbon particles. These cigarette filters remove substantial quantities of nitrogen oxides from cigarette smoke. Chelates suitable for use in this invention are of iron or cobalt and an organic compound containing a

group and a functional group capable of forming a bond with the iron or cobalt atom. In a first embodiment of the cigarette filter aspect of the invention the cigarette filter can comprise a cylinder of crimped, continuous, plasticized cellulose acetate fibers, and the activated carbon particles, having the chelate adsorbed or supported on the surface thereof, are bonded to the cellulose acetate fibers. In a second embodiment of the cigarette filter aspect of the invention the cigarette filter can comprise a first cylinder of crimped, continuous, plasticized cellulose acetate fiber, and coaxially positioned with respect to the first cylinder, a second cylinder of a composition comprising the activated carbon particles having the chelate adsorbed or supported on the surface thereof. In the composition aspect of the invention the composition comprises the material used to prepare the second cylinder. In one aspect of this invention the functional group capable of forming a bond with the iron or cobalt atom can be —OH or

The chelate of cobalt and the condensation product of salicylaldehyde and ethylene diamine is a particularly desirable chelate for use in this invention. Polyethylene glycol diacetate is a particularly desirable plasticizer for the cellulose acetate fibers because it can also be used for bonding the activated carbon particles to the cellulose acetate fibers.

3,724,470

MEANS FOR SECURING HAIR PIECES AND THE LIKE TO THE HEAD AND A METHOD OF USING SAME

Josie Dianne Wilson, P.O. Box 149, Winnsboro, La.

Filed Nov. 17, 1970, Ser. No. 90,360
Int. Cl. A45d *8/00*
U.S. Cl. 132—46 R **5 Claims**

An improved means for securing wigs, wiglets and the like to the head of the user and a method of using such means. The improved means are designed to secure the hair piece more firmly to the head while at the same time affording increased comfort to the user. In one embodiment, the improved means are secured to the head by working the hair of the user into a plurality of U-shaped hooking members to thereby provide a firm bond between said means and the hair. In an alternate embodiment, the improved means is held in place by tufting at

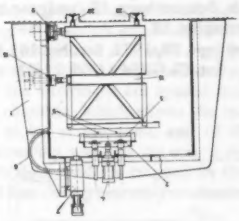
least one, and generally a plurality, of locks of hair in slits provided therefor.

3,724,471

HYDRAULIC PROCESS FOR REMOVING THE ZINC DEPOSITED ON ZINC ELECTROLYSIS CATHODES

F. J. Sitges, Oviedo, Spain, assignor to Asturiana De Zinc, S.A., Oviedo, Spain

Filed Oct. 26, 1970, Ser. No. 83,810
Claims priority, application Spain, Oct. 25, 1969, 372,891
Int. Cl. B08b *3/02*; C23b *7/08*
U.S. Cl. 134—34 **2 Claims**



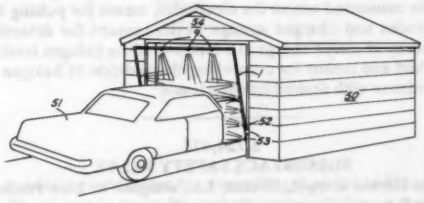
A process for removing zinc deposited on zinc electrolysis cathodes utilizes a high pressure stream of water applied to the cathodes and moved progressively along the line of demarcation between the cathode and deposited zinc.

3,724,472

SPRAY-WASHING APPARATUS FOR VEHICLES

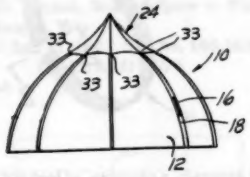
Tobie W. Jenkins, 3330 Ash St.; Delbert G. Jenkins, 3303 Ash St., and Dennis L., Jenkins, 3015 Ash St., all of Denver, Colo.

Filed May 3, 1971, Ser. No. 139,717
Int. Cl. B60s *3/04*
U.S. Cl. 134—93 **2 Claims**



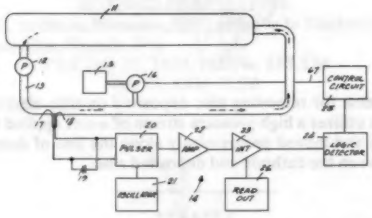
A pipe frame having spray nozzles mounted therealong is pivotally attached at garage doorway to selectively spray-wash an automobile driving in or out of garage. Water supply to the frame may be from house supply, and mechanism is provided to mix soap with the water supply.

3,724,473
AIR-DROP FOLDING PORTABLE SHELTER
Charles W. Moss, 1169 Aberdeen, Ann Arbor, Mich.
Filed Oct. 5, 1971, Ser. No. 186,684
Int. Cl. A45f 1/00, 1/16
U.S. Cl. 135—4 R **16 Claims**



A folding portable shelter which when dropped from an aircraft automatically opens into its erected configuration, locks itself into the erected configuration, and then functions as a parachute to deliver a payload to the ground. The shelter has a ventilating opening in its top, a doorway with a canopy extending from it, and internal partitions. Also, a plurality of the shelters can be joined at their doorways and their bases to form a modular complex shelter.

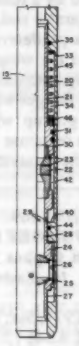
3,724,474
APPARATUS FOR MONITORING AND CONTROLLING HALOGEN LEVELS IN A WATER TREATMENT SYSTEM
Donald P. DeVale, Schaumburg, Ill., assignor to Halogen Controls, Inc., Barrington, Ill.
Filed Sept. 20, 1971, Ser. No. 181,813
Int. Cl. G05d 11/08, 21/02
U.S. Cl. 137—5 **13 Claims**



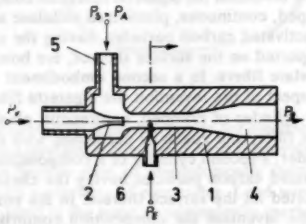
The halogen level in a water treatment system is monitored and controlled by a method which includes continuous sensing of the halogen level in a flow of the water under treatment, detecting insufficient halogen levels, adding halogen in response to detection of insufficient halogen levels, and terminating the addition of halogen upon detection of a second halogen level which is above that of the first-mentioned level. Apparatus for carrying out this method includes a pair of electrodes disposed in a stream of the fluid undergoing treatment, a charge storage device connected across the electrodes, means for pulsing the electrodes and charged storage device, means for detecting the decay of stored charge as a function of the halogen level of the fluid and means for controlling the addition of halogen in accordance with desired halogen levels.

3,724,475
SUBSURFACE SAFETY VALVE
James Harold Ruppel, Gretna, La., assignor to Esso Production Research Company, Houston, Tex.
Filed Dec. 16, 1970, Ser. No. 98,777
Int. Cl. F16k 17/20, 17/36
U.S. Cl. 137—67 **22 Claims**

A subsurface safety valve capable of being installed in and retrieved from a well tubing string is held open by a spring and is closed by well pressure. Erosion from well fluids and/or a predetermined flow rate of well fluids through the valve will cause the valve to close.

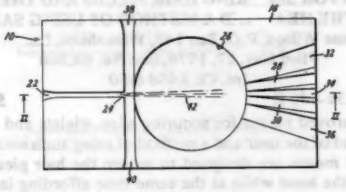


3,724,476
PNEUMATIC AMPLIFIER
Horst Bader, Stuttgart-Fasanenhof, Germany, assignor to J. C. Eckardt AG, Stuttgart, Germany
Filed May 10, 1971, Ser. No. 141,691
Int. Cl. F15c 1/04
U.S. Cl. 137— 842 **14 Claims**



A fluid medium amplifier which includes an operating nozzle, a suction channel and a mixing chamber adjoining the suction channel and operating nozzle as well as a control nozzle downstream of the operating nozzle which as input signal disturbs the mixing progress in the mixing chamber so that an amplified output signal is produced in the suction channel.

3,724,477
LAMINAR RATE SENSOR
Donald L. Rexford, Schenectady, N.Y., assignor to General Electric Company, New York, N.Y.
Division of Ser. No. 878,824, Nov. 21, 1969. This application Jan. 10, 1972, Ser. No. 216,493
Int. Cl. F15c 1/18
U.S. Cl. 137—81.5 **4 Claims**



A laminar fluidic angular rate sensor for sensing the rate of angular rotation of the sensor which includes a supply

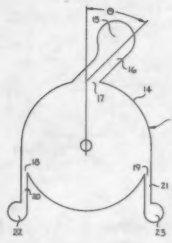
passageway; at least two receiver passageways; vents, at least one of which is located between the two receiver passageways and is aligned with the supply passageways; and a cavity which are of a configuration and location such that fluid flowing through the supply passageway forms a laminar fluid stream which is capable of being received by the receiver passageways in the laminar state. The Reynolds number of the fluid forming the laminar fluid stream is preferably within the rante of 200-1500.

3,724,478

TURN-UP VORTEX VALVE

Kenneth Browning Haefner, Schenectady, and Carl Gustav Ringwall, Scotia, both of N.Y., assignors to General Electric Company, New York, N.Y.

Filed Dec. 17, 1971, Ser. No. 209,276
Int. Cl. F15c *1/16*
U.S. Cl. 137—81.5 **9 Claims**



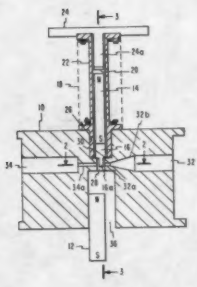
A turn-up vortex valve for modulating fluid flow including an enclosed substantially cylindrical spin chamber having an output port formed in at least one end wall thereof, at least one control pressure port formed in a wall of the chamber for admitting a control fluid flow tangentially to the perimeter of the chamber, and an inlet supply port formed in a wall of the chamber for admitting the fluid supply flow on an angle to the perimeter of the chamber whereby in contradistinction to prior art forms of vortex valves modulation of the supply flow is achieved with control pressure equal to or less than the supply flow pressure and whereby the output flow from the turn-up vortex valve is in phase with the control flow pressure.

3,724,479

PNEUMATIC VALVE

Roger F. Dimmick, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 7, 1971, Ser. No. 141,124
Int. Cl. G05d *16/20*; F15b *5/00*
U.S. Cl. 137—83 **4 Claims**



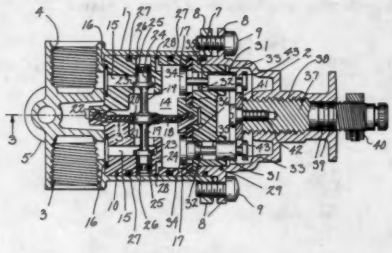
An electrically operated pneumatic valve including a valve block having small diameter inlet and outlet jet ports transmitting an air jet across a cavity, a gate of smaller width than the cavity and movable into the cavity and across the air jet so as to interrupt the jet, an electric coil having a permanent magnet armature therein for moving the gate out of jet blocking position, and a return magnet positioned opposite the armature so as to move the armature into jet blocking position.

3,724,480

PRESSURE COMPENSATED MIXING VALVE

Eugene A. Povalski, and Edwin F. Bolgert, both of Kohler, Wis., assignors to Kohler Co., Kohler, Wis.

Filed Nov. 19, 1971, Ser. No. 200,435
Int. Cl. F16k *19/00*
U.S. Cl. 137—98 **4 Claims**



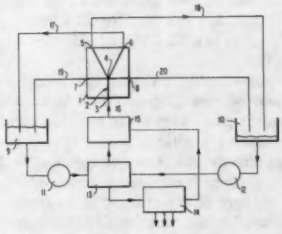
A pressure compensated mixing valve includes a diaphragm actuated compensating valve and a double spool type mixing valve. The mixing valve spools extend into hot and cold inlet sections and are arranged to seal with supply pressure. The two valves are in separate cartridges removably disposed in a valve body; and the cartridges are spaced from the body to define a mixing chamber, which allows the main supply and outlet passages to be at the same end of the valve. Two washers serve as sealing seats for the spools and also as seals between the cartridges, and are trapped by the heads on the spools to prevent loss during assembly or disassembly.

3,724,481

CONTROL INSTALLATION FOR BALANCING FUEL LEVELS IN MOTOR VEHICLE FUEL TANKS

Hans-Dieter Schutzenauer, Schorndorf, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart Untertuerkheim, Germany

Filed April 6, 1971, Ser. No. 131,706
Claims priority, application Germany, April 7, 1970, P 20 16 464.1
Int. Cl. F15c *1/08*; G05d *11/00*
U.S. Cl. 137—101.25 **23 Claims**



A regulating installation for controlling the level of fluid in a plurality of supply tanks for an automotive vehicle. A fluidic control element is arranged in a backflow line for selectively directing the backflow of fuel to the tanks in dependence on the respective levels of fuel existing in the tanks. Control liens leading to the control element from each of the tanks serve for controlling the output of the fluidic control element in

response to the particular level of fuel in the tanks. The specific embodiment utilizes a control element constructed with a single inlet communicating with the backflow line and two outlets arranged symmetrically Y-shaped and communicating with respective first and second tanks. Respective first and second control conduits lead from the tanks to a point in the control element downstream of the outlets for controlling the direction of fluid to one or the other of the outlets.

3,724,482

BREATHING VALVE

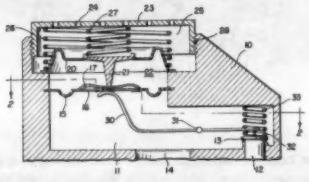
Stafan Walter Ekstrom, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed March 5, 1971, Ser. No. 121,354

Claims priority, application Sweden, March 5, 1970, 2892/70

Int. Cl. A62b *7/04*

U.S. Cl. 137—102 4 Claims



A breathing valve having a housing comprising an inlet chamber in communication with which is an inlet opening controlled by an inlet valve, a passage to the breathing organs of the user and an exhalation valve. A control diaphragm subject on one side to the pressure in the inlet chamber acts through an intermediate member to control the inlet valve. An overpressure valve on the side of the control diaphragm across from the inlet chamber receives fluid through the exhalation valve and when the pressure in the overpressure chamber builds up it causes the control diaphragm to open the inlet valve. Springs act on the two diaphragms urging them towards the inlet valve opened position, thereby setting a predetermined pressure value in the overpressure chamber. With this structure, an overpressure is created in the inlet chamber during both inhalation and exhalation.

3,724,483

SPOOL RELEASE AND SEQUENCE VALVE

Glenn R. Hubbard, Racine, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Division of Ser. No. 76,686, Sept. 30, 1970. This application Jan. 3, 1972, Ser. No. 214,805

Int. Cl. F15b *11/15*

U.S. Cl. 137—106 3 Claims

A hydraulic valve includes a spool movable from an inactive position to a pair of operating positions in each of which one of a pair of motor ports is pressurized. A detent latches the spool in its operating positions, and a spring biased plunger normally urges the detent into engagement with the spool. One side of the plunger is exposed to valve inlet pressure, and normally the plunger is maintained in hydraulic balance by means of restricted communication between its two sides. A pair of pressure responsive valves communicate between the second side of the plunger and the motor ports, and are independently adjustable to open at predetermined pressures thereby to unbalance the plunger and release the spool from the operating positions. The valve may be provided with a centering spring so that upon release the spool returns to its inactive position. Alternatively, the valve is provided with a reversing spring arrangement serving to reverse the operation of the valve when the spool is released from a first operating position so that a pair of operations are automatically carried out in sequence. A system including two or more valves carries out several hydraulic operations in sequence.

3,724,484

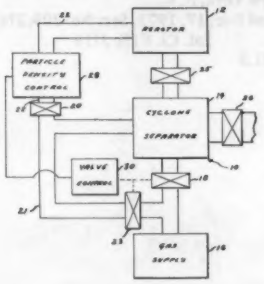
PARTICLE DENSITY CONTROL SYSTEM FOR COLLOID CORE NUCLEAR REACTOR

Bobby N. Turman, Fairborn, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed July 13, 1971, Ser. No. 162,070

Int. Cl. G01n *31/00*; G21c *19/28*

U.S. Cl. 137—110 4 Claims



A control system as provided in the fuel charging system for a colloid core reactor to control the particle density in the fuel input to the reactor cavity. A sound transmitter is positioned on one side of a tubular member in the fuel input, and a microphone is located on the opposite side of the tubular member. A signal, proportional to changes in phase resulting from changes in the acoustics in the tubular member, is used to control the gas flow in a by-pass to a cyclone separator fuel supply to control the particle density in the input to the reactor cavity.

3,724,485

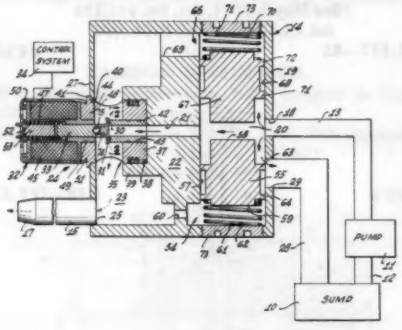
FLOW CONTROLLER

Robert M. Cox, Northridge; Ernest W. Crowley, Chatsworth, and Dan L. Kilmer, Tujunga, all of Calif., assignors to Servo Labs, Inc., Van Nuys, Calif.

Filed May 12, 1971, Ser. No. 142,638

Int. Cl. G05d *7/01*

U.S. Cl. 137—117 21 Claims



A flow controller using a solenoid controlled valve to pass a series of high-frequency flow pulses of controlled and variable duration resulting in an average output flow rate that varies linearly with variations in pulse duration. A relief valve maintains a constant pressure differential across the solenoid valve,

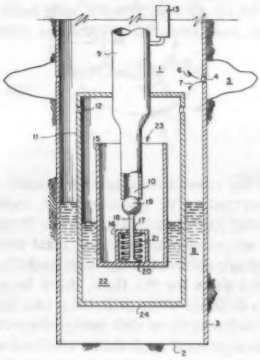
and an accumulator smooths the output of the controller. Also disclosed is an embodiment having a pair of solenoid valves operating out of phase with each other, and a third embodiment having a pressure-balanced flow multiplier for controlling a proportional flow of substantially greater magnitude through a secondary flow line. Conventional pulse-width modulation techniques are used to activate each control valve.

3,724,486

LIQUID SEPARATION IN A WELL

Bobby L. Douglas, Ennis, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 19, 1969, Ser. No. 859,420
Int. Cl. F04f *1/08*
U.S. Cl. 137—190 **3 Claims**



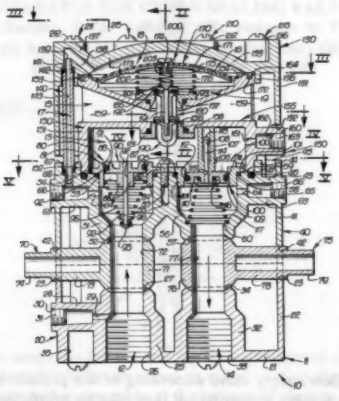
Liquid is separated from gas in a well bore using a liquid container which floats in the well bore liquid and operates a valve which communicates with the interior of the tubing of the well. The valve is resiliently and movably mounted on the container so that the container must move a substantial distance to overcome the resiliency of the mounting and open the interior of the tubing to the liquid in the container.

3,724,487

BACKFLOW PREVENTING VALVE CONSTRUCTION

Edwin J. Hunter, Riverside, Calif., assignor to Toro Manufacturing Corporation, Riverside, Calif.

Filed Oct. 19, 1971, Ser. No. 190,531
Int. Cl. F16k *1/12*
U.S. Cl. 137—218 **22 Claims**



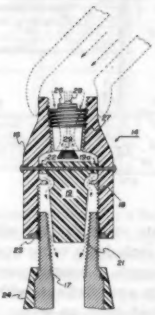
This valve is constructed of a multiplicity of molded parts joined by a variable number of bolts into a body with an inlet passage opening to an intermediate chamber via an inlet check valve with wedging sealing action; with the intermediate chamber opening to an outlet passage via an outlet check valve with wedging sealing action; with a diaphragm chamber having a diaphragm therein to divide the chamber into an inlet pressure portion opening to the inlet passage via a interconnecting passage, and into an intermediate pressure portion opening to the intermediate chamber; and with an exhaust passage opening to atmosphere and to the intermediate chamber via a relief valve connected by a spring to the diaphragm whereby fluid normally flows from the inlet passage through the intermediate chamber to the outlet passage but upon attempted backflow of the fluid, the check valves close to prevent such backflow and upon failure of the outlet check valve, the diaphragm flexes to open the relief valve to vent such backflowing fluid, and before failure of the outlet check valve, the spring between the diaphragm and the relief valve compensating for slight flexing of the diaphragm to maintain the relief valve closed and prevent fluid spitting due to slight changes in the pressure of the incoming fluid.

3,724,488

COMBINATION SEAL CAP AND VALVE

Arthur H. Featherstone, 2895 Scenic View Road, Alpine, Calif.

Filed Oct. 1, 1971, Ser. No. 185,755
Int. Cl. F16k *15/20*
U.S. Cl. 137—223 **2 Claims**



A combination seal cap and valve for use with a standard pneumatic tire stem valve having an outer sleeve internally threaded at one end for an internal threadable engagement with a standard valve stem and internally threaded at another end for threadably receiving a standard stem valve. A tapered plug member captured within the outer sleeve and dimensioned for sealing the standard valve stem when the outer sleeve is snugly mounted thereto and for allowing an air passage through said sleeve and said standard valve stem into a tire when backed off from a snug installation.

3,724,489

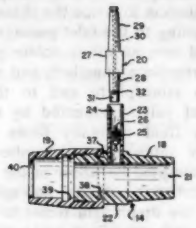
FRACTIONAL INSPIRATORY OXYGEN MONITORING VALVE APPARATUS

Bela Eross, Penn Hills Township, Allegheny County, Pa., assignor to Instrumentation Industries, Inc., Pittsburgh, Pa.

Filed May 21, 1971, Ser. No. 145,802
Int. Cl. F16l *37/28*, *47/00*
U.S. Cl. 137—322 **7 Claims**

The specification discloses a fractional inspiratory oxygen monitoring valve apparatus, adapted for insertion in respiratory systems used in hospitals for administering oxygen to patients. The monitoring valve apparatus enables withdrawal of a sample of the oxygenated air stream to the patient for purposes of supply to the oxygen analyzer, and insures against

leakage of oxygen from the system when the sampling withdrawal is terminated. The apparatus is simple in construc-

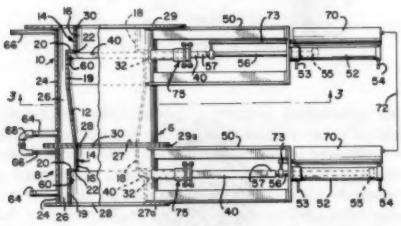


tion, of relatively low cost, and readily installable and operable by persons of minimal skill or special training.

3,724,490
GATE VALVE

Walter W. Kramer, Allentown, Pa., assignor to Fuller Company, Catasaugua, Pa.

Filed July 6, 1970, Ser. No. 52,316
Int. Cl. F16k *49/00*
U.S. Cl. 137—340 **8 Claims**

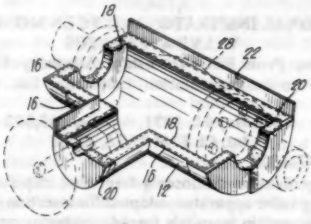


A water cooled gate valve for use with high temperature materials. The valve includes a valve body having a material flow passage therethrough. A housing surrounds and is spaced from the valve body and defines with the valve body a chamber. Cooling fluid such as water is circulated in this chamber. The gate of the valve is hollow and is provided with an arrangement for circulating cooling fluid therein. The valve may be used in pairs in conjunction with a gas-solids separator such as a cyclone separator.

3,724,491
REMOVABLE VALVE INSULATION AND COVER

Kai Knudsen, 947 Provencher Boulevard, and Bent Knudsen, 465 Valery St., both of Ville Brossard, Quebec, Canada

Filed April 5, 1971, Ser. No. 131,174
Claims priority, application Canada, April 6, 1970, 079359
Int. Cl. F16l *59/16*
U.S. Cl. 137—375 **3 Claims**

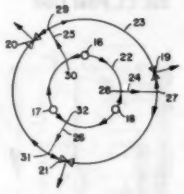


An insulating shell for a valve made up of a plurality of sections which mate together about the valve and each section has inner and outer skins with insulation material between the skins.

3,724,492
DISTRIBUTOR FOR VISCOUS FLUID SPINNING MELTS OR SOLUTIONS

Friedhelm Itter, Remscheid, Germany, assignor to Barmer Barmag Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed May 5, 1971, Ser. No. 140,423
Int. Cl. F16k *19/00*
U.S. Cl. 137—597 **9 Claims**



A distributor for viscous fluid spinning melts or solutions in apparatus for extruding or spinning high molecular weight polymers, especially synthetic fiber-or film-forming polymers, the distributor essentially including at least one ring conduit into which there are connected through lateral ports a plurality of sources and sinks for the fluid, there being at least one source with two or more sinks or at least one sink with two or more sources, each source or sink being connected to the ring conduit in an arrangement such that a substantial pressure difference exists as between a source and two adjacent sinks or between a sink and two adjacent sources, and valve means preferably in the form of poppet valves adapted to open and close individual ports while keeping the cross-section of the ring conduit substantially open, thereby maintaining a minimum flow or circulation of the viscous fluid material throughout the distributor.

3,724,493
LOW FLOW SAFETY VALVE

James W. Kisling, III, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed April 28, 1971, Ser. No. 138,138
Int. Cl. F16k *17/24*
U.S. Cl. 137—459 **10 Claims**

A low flow safety valve according to the present invention relates to a valve construction that may be employed in conjunction with flow conduits such as well production tubing and the like. The valve construction is operative to allow the flow

of production fluid through the valve structure as long as the rate of flowing pressurized fluid is above a predetermined minimum sufficient to develop a predetermined pressure differential across a restriction defined within the valve structure. As fluid flow and consequent pressure differential reduce below predetermined minimum levels, actuating means achieves closing of the valve and locking means effectively locks the valve structure against inadvertent reopening. The safety valve also includes means for unlocking and reopening the valve mechanism for the purpose of resuming production flow through the conduit structure with which the valve is associated.

3,724,494

FLOW REGULATING VALVE

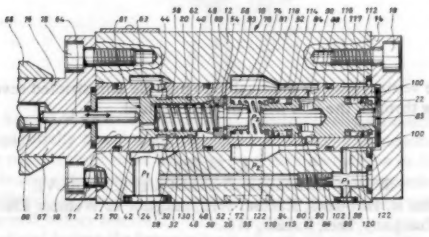
Hans Alber, 1324 Outlook Drive, Mountainside, N.J.

Filed Nov. 2, 1970, Ser. No. 86,052

Claims priority, application Germany, Nov. 3, 1969, P 19 55 044.8

Int. Cl. G05d *7/00*

U.S. Cl. 137—501 **22 Claims**



In a chamber of a housing provided with at least one inlet and at least one outlet is accommodated a sleeve having a longitudinally extending passage as well as first and second flow ports communicating with the passage and with the inlet and outlet respectively. A throttling piston is located in the passage displaceable longitudinally thereof with reference to the first ports. A substantially fluid-flow throttling passage is provided in either the outer circumferential surface of the throttling piston or in the inner circumferential surface bounding the passage, and in any case extends longitudinally of the passage and communicates with the respective ports. A control piston is located in the passage downstream of and axially adjacent to the throttling piston for maintaining constant fluid flow through the passage.

3,724,495

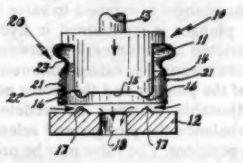
APPARATUS FOR CLEAN SEALING VALVES

Jack G. Hartley, Kelso Valley, Calif., assignor to The United States Of Amercia as represent by the Secretary Of Air Force

Filed Feb. 11, 1971, Ser. No. 114,443

Int. Cl. F16k *1/00*

U.S. Cl. 137—547 **1 Claim**



A filter assembly for preventing the entrapment of fluid-entrained particles between metal-to-metal sealing elements of a poppet-type valve assembly at the instant of closure. The filter assembly includes a cylinder-shaped filter holder which is perforated and which surrounds the periphery of the valve head, (i.e. poppet), a filter attached to the filter holder, and a bellows for attaching the filter holder, with the filter attached thereto, to the valve head. The filter assembly is so positioned and is so dimensioned that, when the valve is in the open position, there is unrestricted fluid flow and, at the instant immediately prior to valve closure, there is clean, filtered fluid flow. As a result, at closure there are no particles which can become entrapped between the metal-to-metal sealing elements, and the valve seals cleanly.

3,724,496

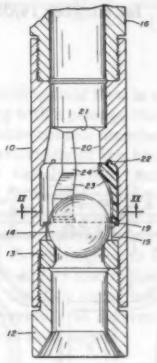
CAGE AND GUIDE CONSTRUCTION FOR A BALL-TYPE VALVE

Walter S. Secrist, Dallas, Tex., assignor to United States Steel Corporation

Filed Nov. 11, 1971, Ser. No. 197,685

Int. Cl. F16k *15/04*

U.S. Cl. 137—533.13 **4 Claims**



A cage and guide construction for a ball-type valve, used for example in a subsurface pump. The cage has spaced apart internal shoulders which have confronting grooves. The guide pieces lie between the shoulders and have lips received in the grooves to lock them in place. The guide pieces can be either metal or elastomer and are not distorted when inserted or removed.

3,724,497

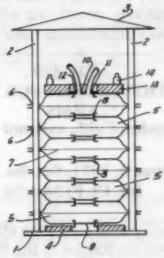
STORAGE SYSTEM FOR GASEOUS FLUIDS AND THE LIKE

Fritz Federer, Tuerkenfeld, and Henning Neumann, Germering, both of Germany, assignors to Metzeler Aktiengesellschaft, Munich, Germany

Filed March 4, 1971, Ser. No. 121,020

Int. Cl. B65d *89/04*

U.S. Cl. 137—575 **22 Claims**



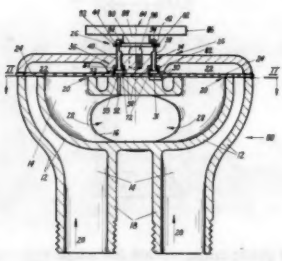
A plurality of discrete and individually movable storage vessels are provided each having a hollow interior. The vessels

may be of various different shapes and may be rigid but are preferably at least in part of elastic material so that they can be collapsed when empty. They are superimposed in vertically stacked relationship, or they are arranged in side-by-side or horizontally stacked relationship and can be connected with one another so that their respective interiors communicate. They are supported and guided by suitable guide means and weights or spring-biased devices may be provided for applying a predetermined force to a terminal one of the vessels of a respective stack, to thereby subject the contents to a predetermined pressure and to expel them at a predetermined rate of flow through conduits provided for this purpose.

3,724,498
VALVES

John Laddier de Villiers, 1 Brakfontein, Verwoedburg District, Republic of South Africa

Division of Ser. No. 54,343, July 13, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,458
Int. Cl. F16k *19/00*
U.S. Cl. 137—607 **4 Claims**



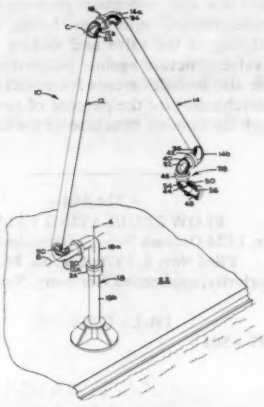
A valve comprising means defining a flow passage, valve seat means in the passage, a bias chamber to receive a working fluid and having a wall which is displaceable and adapted to cooperate with the valve seat means to regulate fluid flow through the passage, and control means to control the volume of fluid held captive in the bias chamber thereby controlling the displacement of the displaceable wall relative to the valve seat means. The control means comprises an inlet bleed passage to place the bias chamber in communication with a source of working fluid under pressure, an outlet bleed passage leading out of the bias chamber, and inlet and outlet control valves operatively associated with the bleed passages, with the control valves biassed into their closed positions.

3,724,499
ANTI-CAVITATION SYSTEM FOR FLUID LOADING ARMS

Sam Huniu, Los Angeles, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed June 3, 1971, Ser. No. 149,681
Int. Cl. F15d *1/04*
U.S. Cl. 137—615 **10 Claims**

A system of specially modified pipe elbows and a back pressure device to control cavitation in the fluid flowing through a fluid loading arm, thus minimizing noise generation and pipe vibration, and facilitating greatly increased flowrates. The arm's elbows contain one or more rigid vanes curved in the configuration of the flow passage through the elbow in which they are mounted, and the back pressure device comprises a cavitating venturi positioned at the discharge end of the arm.

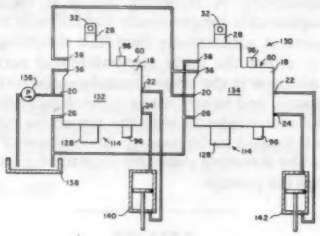


The venturi may be removable to provide unrestricted reverse flow through the arm when unloading fluid.

3,724,500
SPOOL RELEASE AND SEQUENCE VALVE

Glenn R. Hubbard, Racine, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Division of Ser. No. 76,686, Sept. 30, 1970, Pat. No. 3,650,297. This application Jan. 3, 1972, Ser. No. 214,940
Int. Cl. F15b *11/22*
U.S. Cl. 137—624.18 **1 Claim**

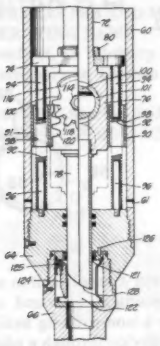


A hydraulic valve includes a spool movable from an inactive position to a pair of operating positions in each of which one of a pair of motor ports is pressurized. A detent latches the spool in its operating positions, and a spring biased plunger normally urges the detent into engagement with the spool. One side of the plunger is exposed to valve inlet pressure, and normally the plunger is maintained in hydraulic balance by means of restricted communication between its two sides. A pair of pressure responsive valves communicate between the second side of the plunger and the motor ports, and are independently adjustable to open at predetermined pressures thereby to unbalance the plunger and release the spool from the operating positions. The valve may be provided with a centering spring so that upon release the spool returns to its inactive position. Alternatively, the valve is provided with a reversing spring arrangement serving to reverse the operation of the valve when the spool is released from a first operating position so that a pair of operations are automatically carried out in sequence. A system including two or more valves carries out several hydraulic operations in sequence.

3,724,501
UNDERSEA WELL TEST TREE CONTROL VALVE AND SYSTEM

Lyle B. Scott, South Gate, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed Jan. 21, 1971, Ser. No. 108,534
Int. Cl. F16k 31/12
U.S. Cl. 137—630.19 5 Claims

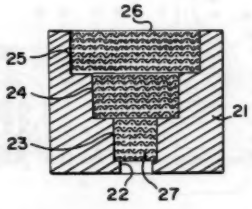


As part of a subsea well system, a hydraulically actuated and sequentially opening and closing control valve incorporating an upper rotary valve actuated by a rack and pinion or linear actuator arrangement coupled with a lower valve actuated by a stinger or mandrel arrangement whereby the lower valve is opened before the rotary valve is opened and the rotary valve is closed before the lower valve is closed. The lower valve may be of the flapper type. The valve incorporates a hydraulic operator actuated in one direction to open the valve by application of hydraulic pressure from a remote source, and actuated in the reverse direction to close the valve by resilient springs and/or by subsea hydrostatic pressure. The valve may also be closed by closing the rams of the blowout preventer in the subsea system above the valve and applying pressure through the kill line of such blowout preventer.

3,724,502
GAS PRESSURE REDUCING RESTRICTORS

Paul F. Hayner, Lexington, Mass., and Richard J. Brockway, Amherst, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 27, 1970, Ser. No. 93,193
Int. Cl. F15d 1/02
U.S. Cl. 138—41 4 Claims

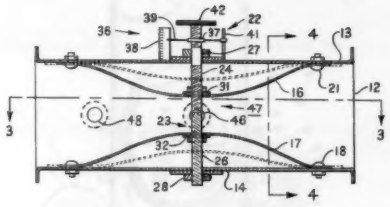


A restrictor for reducing the pressure of a fluid comprises essentially many layers of wire mesh in the path of fluid flow and some arrangement for defining a flow path which increases in cross sectional area either continuously or in steps in the direction of flow. Such a path may be defined, for example, by a tapered housing enclosing the layers of mesh, an interiorly stepped housing or a number of constrictions of various sizes positioned within a uniform housing.

3,724,503
FLOW MEASUREMENT AND CONTROL

Gerhart M. Cooke, Napa, Calif., assignor to Aeroquip Corporation, Jackson, Mich.

Filed April 30, 1971, Ser. No. 138,914
Int. Cl. F17d 1/10
U.S. Cl. 138—45 4 Claims

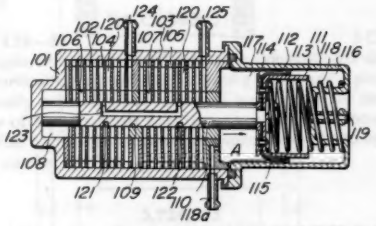


A device for controlling fluid flow in accordance with measured flow. A housing with a passage therethrough is provided internally with movable control members and control means therefor extending externally of the housing to thus define a variable venturi or variable flow nozzle for controllably restricting fluid flow through the passage. A pair of apertures in the housing communicating with the passage, one at or near the throat of the venturi or flow nozzle and one upstream thereof, are adapted for connection to a differential pressure indicating means, which may also include recording and controlling functions. A capacity curve is employed with the indicated differential pressure to determine the proper throat opening for any desired fluid flow.

3,724,504
APPARATUS FOR ESTABLISHING A VARIATION OF TIME DELAY BETWEEN INPUT AND OUTPUT FLUID SIGNALS

Kazuma Matsui, Toyohashi, and Hideo Tsubouchi, Kariya, both of Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Filed March 26, 1971, Ser. No. 128,374
Int. Cl. F16k 31/145, 47/12
U.S. Cl. 138—46 5 Claims



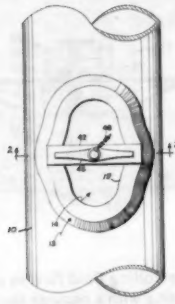
Apparatus for establishing a variation of time delay between input and output fluid signals comprising a variable-circuit-length body and a pressure-activated body, said device being so constructed that a fluid signal applied to a power supply port on said first body may be delayed in time according to a variation of pressure in the pressure-activated body, said variable-circuit-length body being provided with spiral grooves for delaying the fluid signal.

3,724,505

PIPE OR CONDUIT CLEAN OUT TRAP ASSEMBLY

Gunenter Jahn, 455 Provencher Boulevard, Winnipeg, Manitoba, Canada

Continuation-in-part of Ser. No. 829,556, June 2, 1969, abandoned. This application May 11, 1971, Ser. No. 142,254
Int. Cl. F16l 55/10, 55/16
U.S. Cl. 138—92 1 Claim



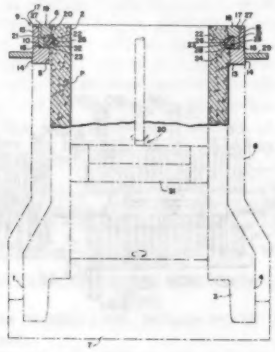
A pipe elbow has an access opening provided with a marginal frame which is undercut to seat the elbow wall and is recessed to receive a closure plate so that the bottom surface of the closure plate and the frame are flush with the inner surface of the elbow wall in a smooth continuity. A flange on the upper surface of the closure plate inside the recess supportingly abuts a gasket which seals against the top wall of the recess when the closure plate is held in position by external clamping means. The supporting abutment of the flange with the gasket is directly opposite to the line of force of any fluid entering the recess from the interior of the elbow.

3,724,506

PIPE HAVING DISPOSABLE PROTECTIVE MEANS THEREON AND METHOD OF MAKING SAME

Larry G. Crowe, 1020 3rd Avenue N.E., Waverly, Iowa

Filed Feb. 22, 1971, Ser. No. 117,616
Int. Cl. B65d 59/00; B28b 21/22
U.S. Cl. 138—96 3 Claims



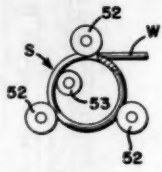
A pipe having a resilient disposable protective ring on one end thereof, wherein the ring is utilized during manufacture of the pipe for forming an annular groove at one end of the pipe for receiving an O-ring therein when the pipe is installed to another pipe, said ring being left in place after the pipe is manufactured to prevent breakage of the pipe during storage and handling of the pipe, and said ring being removed and thrown away when the pipe is to be installed to another pipe.

3,724,507

CONTINUOUSLY MANUFACTURED FLEXIBLE CONDUIT

Donald L. Kleykamp, West Carrollton, Ohio; Ivan Gaster; Vernon D. Browning, both of Waynesville, N.C., and Homer N. Holden, Sylva, N.C., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 89,333, Nov. 13, 1970. This application March 6, 1972, Ser. No. 231,854
Int. Cl. F16l 11/08
U.S. Cl. 138—122 2 Claims



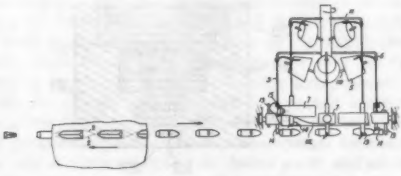
A wire is fed from a supply roll to a device which twists the wire on its longitudinal axis and continuously forms the twisted wire into a non-rotating helical coil. The coil is fed directly from the device through a plastic tube extruding head by a rotatable screw which extends within the coil, and a vacuum is created within the tube as it is extruded over the coil to shrink the tube between the turns of the coil. The coil reinforced tube may then be fed through a device which covers the tube with a continuous fabric member, and the covered tube is then fed through another extruder head which extrudes a second tube over the fabric member and shrinks the second tube onto the fabric member and the first tube. The coil feeding screw, the fabric member forming device, the extruders, and the tube feeding devices are driven at speeds correlated with the speeds of twisting and feeding the wire to provide a continuous conduit forming operation.

3,724,508

METHOD OF AND APPARATUS FOR FILLING THE SHUTTLES WITH WEFT ON PROGRESSIVE SHED WEAVING LOOMS

Frantisek Jekl, Usti nad Orlici; Vladimir Mateju, Usti nad Orlici; Josef Pech, Brno, and Karel Hrdina, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavinarsky, Usti nad Orlici, Czechoslovakia

Filed April 26, 1971, Ser. No. 137,338
Claims priority, application Czechoslovakia, April 28, 1970, 293370
Int. Cl. D03d 47/26, 45/00
U.S. Cl. 139—12 10 Claims



Method of and apparatus for filling the shuttles with weft on progressive shed weaving looms with continuous movement of shuttles along a closed path by means of supply units on a part of a common rotary path along which the supply units and the shuttles move in the same direction with the same speed and at conforming spacings. In the section where the path of the shuttle and that of the supply unit coincide the weft thread is withdrawn from the supply of weft thread and deposited in the form of windings created irrespectively of the running of the

weaving loom in a plane identical with the rotary plane of the shuttles in a length proportional to the total multiple of coils on a standing selectively rotatable bobbin disposed in a recess of the shuttle. After the shuttle and the supply unit have parted, the coils on the shuttle are separated from the supply, while at least one end of the supply of weft thread is already held.

3,724,509

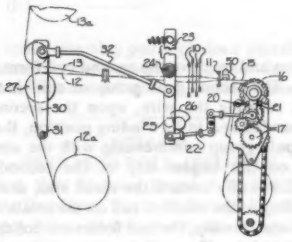
TEMPLE FOR TERRY LOOMS AND METHOD OF OPERATING SAME

Douglas P. Burgess, Woodleaf, and Johnny D. Harkey, Concord, both of N.C., assignors to Cannon Mills Company, Kannopolis, N.C.

Filed July 16, 1971, Ser. No. 163,395

Int. Cl. D03d *39/22*; D03j *1/22*

U.S. Cl. 139—25 **5 Claims**



To avoid damage to terry loops formed on that portion of terry cloth which passes through a temple during weaving on the type of terry loom whose cloth is shifted forwardly and backwardly in alternation incident to forming the terry loops, the temple is shifted forwardly and rearwardly with the cloth solely by transmitting such movement directly from the cloth to the temple so there is essentially no relative movement between the cloth and the temple during terry weaving other than the normal take-up of the cloth.

3,724,510

A DOBBY

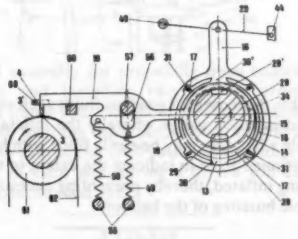
Walter Kleiner, Wadenswil, Switzerland, assignor to Staubli Ltd., Zurich, Switzerland

Filed May 26, 1971, Ser. No. 146,958

Claims priority, application Switzerland, May 29, 1970, 8037/70

Int. Cl. D03c *1/00*

U.S. Cl. 139—66 R **6 Claims**



Dobby with logic control, in which for each heald shaft a needle reads a pattern card and controls the heald shaft operating mechanism, wherein first the reading needle (4) and pattern card perform in the longitudinal direction of the two card reciprocally a pilgrim step movement (61), namely two steps forward, one step backward, and second the reading needle and pattern card perform a reciprocal movement in transverse direction to the pattern card preferably each for a half or full interval back and forth (68).

3,724,511

DEVICE FOR CONTROLLING A WEDGE COUPLING, PARTICULARLY IN A DOBBY

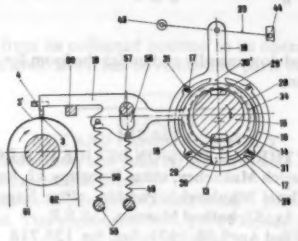
Walter Kleiner, Wadenswil, Switzerland, assignor to Staubli Ltd., Zurich, Switzerland

Filed May 26, 1971, Ser. No. 146,959

Claims priority, application Switzerland, May 29, 1970, 8036/70

Int. Cl. D03c *1/00, 15/00*

U.S. Cl. 139—66 R **6 Claims**



Dobby, in which the movement of the heddle frames is effected by a connecting rod (18), which connecting rod is mounted through an eccentric ring (28) on the driving shaft (15). The control of such movement is accomplished by a coupling wedge (13) which is supported in the eccentric ring and is connected in control relationship alternatively to the driving shaft or to the connecting rod. The control of the wedge is effected by means of a ring (14) movably arranged around the driving shaft, on which ring the wedges slides. One end of an arm (10) is secured to the ring, which arm carries on its other end the reading needle (4). The arm is supported through a slot (56) on a stationary member (57). The springs (49,50) acting onto the arm (10) and the supporting of the arm in the slot cause and permit the arm to tilt and yield in response to the position of the wedge and the needle.

3,724,512

JACQUARD MECHANISM

Karl Kohl, Chlorodontstrasse 10, Obertshausen, near Offenbach/Main, Germany

Filed March 3, 1972, Ser. No. 231,570

Claims priority, application Germany, March 4, 1971, P 21 10 355.9

Int. Cl. D03d *3/42*

U.S. Cl. 139—85 **3 Claims**

A jacquard mechanism of otherwise conventional design, with a vertically reciprocating mounting board and a plurality of vertically extending hooks has the guide plate for the like plurality of harness cords fixedly connected to the mounting board. The harness cords connect respective hooks to operating pins carried by a bar.

3,724,513

LOOM HAVING A COMMON FRAME FOR THE WARP AND CLOTH BEAMS

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Oct. 29, 1968, Ser. No. 771,472

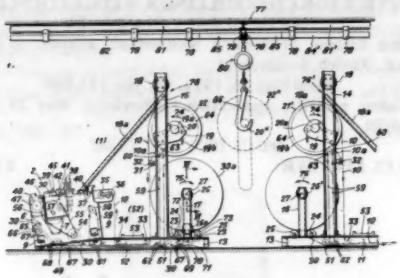
Claims priority, application Switzerland, July 19, 1968, 10903/68

Int. Cl. D03d *49/02, 49/04*

U.S. Cl. 139—1 **21 Claims**

The warp beam and cloth beam are both mounted at the rear of the loom with the warp beam over the cloth beam. The

warp yarn is then led downwardly and across to the loom while



the cloth is led downwardly and under the loom for take-up on the cloth beam.

3,724,514

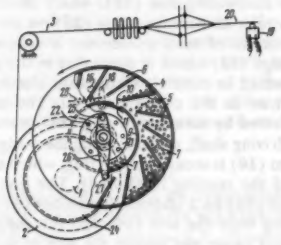
WARP THREAD TENSION DEVICE IN A LOOM

Nikolai Ivanovich Makachev, ulitsa Tsjurupy 12, korpus 1, kv. 27, and Alexei Nikolaevich Parshin, ulitsa Nagorhaya, 34, korpus 43, kv. 53, both of Moscow, U.S.S.R.

Filed April 20, 1971, Ser. No. 135,718

Int. Cl. D03d *49/06*

U.S. Cl. 139—100 **6 Claims**



A tension device, comprising a rotating beam wherefrom warp threads are wound off, and a drum with inner radial blades that form separate sections. At least part of these sections accommodate loose, and the length of the blades is chosen so that between their free ends and the drum axle there remains an annular clearance sufficient for the weights to spill from one section into another during the drum rotation, to develop a torque opposing rotation. A casing is mounted in the drum within the annular clearance and a part of the casing can be selectively opened to allow loose weights to fall into the casing to reduce the counter acting torque.

3,724,515

APPARATUS FOR WINDING TWO POLE DYNAMOELECTRIC MACHINE FIELD COILS

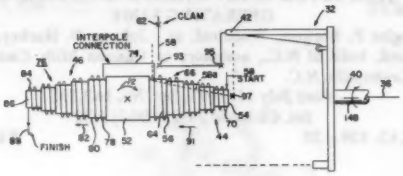
Robert J. Eminger, Fort Wayne, Ind., assignor to Essex International Inc., Fort Wayne, Ind.

Filed Dec. 28, 1970, Ser. No. 101,587

Int. Cl. B21f *3/04*

U.S. Cl. 140—92.1 **11 Claims**

A method and apparatus for winding field coils for a two pole dynamoelectric machine stator core member, the field coils comprising first and second pole groups of coils each having a plurality of progressively smaller concentric coils. In accordance with the method, the first pole group of coils is wound, without severing the wire from which the coils are wound, upon the first of two stepped, collapsible coil forms with the first coil form being expanded and at a winding position and the second of the coil forms being at an inactive position. Each of the coil forms has a forward distal end and a rear proximal end mounted on a rotatable turret, the smaller step of each coil form being adjacent its distal end and the largest step being adjacent its proximal end. The winding of the first pole group commences with winding of the smallest coil on the smallest step of the first coil form, progresses rearwardly toward the proximal end, and concludes with winding of the largest coil on the largest step of the first coil form. The turret is then indexed, still without severing the wire, thereby to move the first coil form with the coils wound thereon to the inactive position and to move the second coil form to the winding position. The second pole group of coils is then wound, still without severing the wire, upon the second coil form which is expanded and in its winding position, the winding of the second pole group commencing with the winding of the largest coil on the largest step of the second coil form, progressing forwardly toward the distal end, and concluding with the winding of the smallest coil on the smallest step of the second coil form. Finally, the coil forms are collapsed and the coils are removed therefrom.



3,724,516

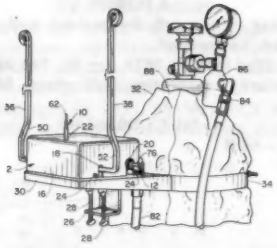
GAS DISPENSER AND INFLATION GAUGE

Edward E. Elson, Anaheim; Kenneth L. McQuary, Marina Del Rey; George H. Karlin, Beverly Hills, and Bert Lane, Palm Springs, all of Calif., assignors to Automatic Helium Balloon Systems, Inc., Beverly Hills, Calif.

Filed April 23, 1971, Ser. No. 136,899

Int. Cl. B65b *1/30*

U.S. Cl. 141—95 **10 Claims**



A portable dispenser for gaseous fluids such as, for example, helium and inflation gauge whereby the inflatable article, as for example a balloon, may be easily filled with helium and the gauge positioned so as to indicate the extent to which the balloon is being inflated, thereby preventing excessive helium use and possible bursting of the balloon.

3,724,517

PLANING APPARATUS

Raymond S. Edwards, Route 3, P.O. Box 481, Roxboro, N.C., and Thomas L. Guy, Route 6, P.O. Box 188-84, Greensboro, N.C.

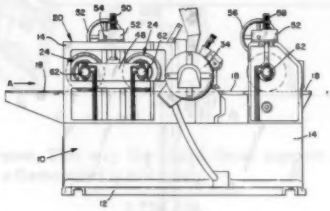
Filed Sept. 8, 1970, Ser. No. 70,424

Int. Cl. B27c *1/12*

U.S. Cl. 144—116 **2 Claims**

Apparatus having upper and lower rotary cutter heads for planing stock advanced therethrough. The stock is uniformly

gripped and advanced by opposed pairs of roller assemblies regardless of irregularities or variations in the thickness of the

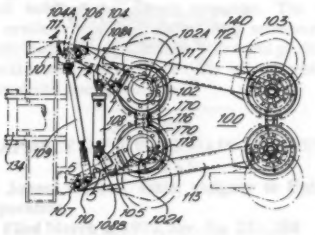


stock. Each roller assembly pair includes a plurality of axially aligned, pneumatic tires coupled together for rotation by keyed hub members and driven by hydraulic means.

3,724,518
TREE FEED ROLL ASSEMBLY

Samuel Zehavi, Cote St. Luc; Joseph J. R. Boivin, Montreal, Douglas D. Hamilton, Town of Mount Royal, and Raoul Ranzenhofer, Pointe Claire, all of Quebec, Canada, assignors to Canadian International Paper Company; North Shore Paper Company; both of Montreal, Abitibi St. Anne Paper Ltd., Beaupre, all of Quebec, Canada

Filed March 12, 1971, Ser. No. 123,804
Claims priority, application Canada, March 13, 1970, 77403
Int. Cl. B27l *1/00, 11/02*
U.S. Cl. 144—247 15 Claims



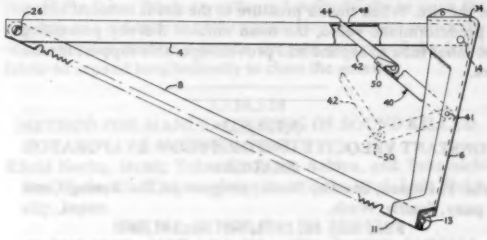
A feed roll assembly for propelling trees endwise along a selected path and including two sets of arms pivotally mounted on a frame with one set extending a greater distance from the frame than the other set, one set of said arms being located on one side of the feed path and the other set on the opposite side of each arm having a driven roll cantilevered therefrom to overlap said path.

3,724,519
COLLAPSIBLE SAW

Wilfred M. McCord, Jr., Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.

Filed April 6, 1971, Ser. No. 131,709
Int. Cl. B27b *21/02*
U.S. Cl. 145—33 E 5 Claims

Ideal compact saws for outdoorsmen are those having a straight frame member and a handle pivotally connected to one end of the frame. A blade is connected across the angle formed by these two members, from the free end of the frame member to the base of the handle to form a triangularly shaped saw. A triangular saw is provided herein which is easier

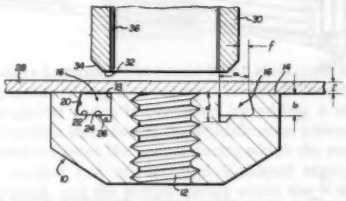


to convert from its collapsed position to its operable position than known saws, and it has no removable parts to get lost.

3,724,520
NUT AND PANEL ASSEMBLY

Harold A. Ladouceur, and John H. Steward, both of 12668 Arnold Avenue, Detroit, Mich.

Continuation-in-part of Ser. No. 841,037, July 11, 1969, abandoned. This application Nov. 19, 1970, Ser. No. 90,923
Int. Cl. F16b *39/34*
U.S. Cl. 151—41.73 20 Claims

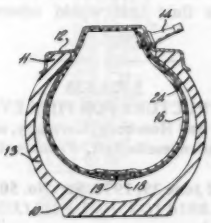


A pierce nut having a panel metal receiving groove especially designed to achieve improved panel retention characteristics. The panel metal receiving groove of the nut is formed with an undercut outer side wall, and the groove bottom at the inner wall is deeper than at the outer wall, defining a tool receiving recess at the inner wall. A piercing tool having a bevel or ramp surface at its outer edge forces the panel metal inwardly into underlying relationship with the undercut outer groove wall during the piercing operation, securely interlocking the nut and panel.

3,724,521
ANTI-FLAT DEVICE

David M. Coddington, Piscataway; William D. Marsh, Cranford, and Harvey Cohen, Woodbridge, all of N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed May 6, 1971, Ser. No. 140,879
Int. Cl. B60c *17/00*
U.S. Cl. 152—340 14 Claims



An anti-flat device for a tubeless pneumatic tire comprising an expandable toroidal air pressure reservoir or small inner

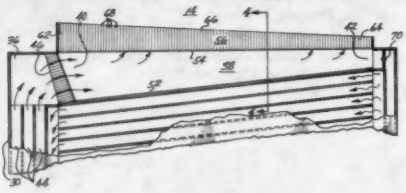
tube restrained by a folded and stitched fabric band to prevent the inner tube from filling the tire even though the inner tube is inflated to a higher pressure than that normally employed for the tire. When the air pressure in the tire is reduced below a predetermined value, the band unfolds thereby permitting the inner tube to expand and provide operable support for the tire.

3,724,522

CONSTANT VELOCITY UNIFORM FLOW EVAPORATOR HEADER

John T. Pogson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 10, 1971, Ser. No. 141,891
Int. Cl. B01d *1/22, 3/00*; A23c *3/04*; E03b ; B01d *3/08*
U.S. Cl. 159—13 B **15 Claims**



An overflow evaporator header providing equal volumetric flow from an upper overflow edge including a generally horizontal longitudinally extending header duct for placement on top of a falling film evaporator panel with said header duct having a first inlet end, a second end, and having a varying transverse cross sectional flow area decreasing from the first end to the second end to provide constant velocity of fluid flow therethrough. A fluid exit port having an open ended cellular structure positioned on top of the header duct and in fluid communication therewith allows the fluid to flow upwardly and out onto an upper overflow surface. The passageways of the fluid exit port can be varied in length, height above a reference datum, or in cross sectional area to compensate for fluid flow frictional pressure losses and fluid flow turning losses experienced by the fluid in flowing down the length of the header duct and upward into the passageways thus providing equal volumetric flow of fluid from each passageway onto the upper overflow surface. Flow director vane structures may be positioned near the inlet end of the header duct to direct the fluid generally longitudinally into the header duct and outlet means may be provided at the second end of the header duct to provide for the discharge of solids contained in the fluid that would otherwise accumulate therein.

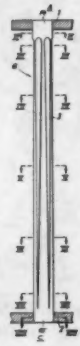
3,724,523

TUBULAR STRUCTURE FOR FILM EVAPORATORS

Konrad Mattern, Bad Homburg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 29, 1970, Ser. No. 50,752
Int. Cl. B01d *1/22, 1/00*; F28f *13/08, 1/00*
U.S. Cl. 159—13 A **6 Claims**

A tube-bundle evaporator through the interior of the tubes of which the liquid to be evaporated is passed. The tubes are deformed so that the flow cross-section increases longitudinally in the direction of flow of the vapor while the perimeter or peripheral extent of the tube and, preferably, the diameter of the smallest circumscribing circle remains constant over the entire length of the tube.

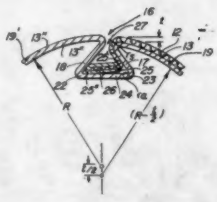


3,724,524

PICTURE SCREEN ROLLER FABRIC ATTACHMENT

Fred S. Potter, Warsaw, Ind., assignor to Da-Lite Screen Company, Inc., Warsaw, Ind.

Filed Feb. 25, 1971, Ser. No. 118,626
Int. Cl. E04f *10/06*
U.S. Cl. 160—24 **2 Claims**



A projection screen having a spring roller with a fabric-locking groove comprised of opposed side walls stepped on the roller periphery to the thickness of the fabric for producing safe mounting and flat hanging of picture surfaces, the side walls of which groove outwardly converge on a gap in the roller periphery of width equal to about twice the thickness of the screen fabric forming an inwardly-bent, wedging channel for locking on a metal strip clamped to the inner edge of the fabric screen and inserted therein so that the more the fabric is pulled, the tighter and more uniformly the screen will be held and the flatter the fabric will hang during use.

3,724,525

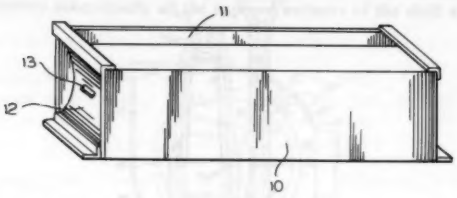
WINDOW SHADE SUPPORTS

Roger L. Boneck, W-140, N-5550 Lilly Road, Menomonee Falls, Wis.

Filed July 12, 1971, Ser. No. 161,557
Int. Cl. E06b *9/08*
U.S. Cl. 160—28 **3 Claims**

A window shade support comprises an attractive elongated box having a concealed shade mounted therein. Angular

brackets on the box may be slipped into mating notches on the



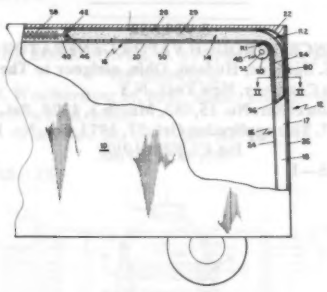
window frame. This way the entire shade support assembly snaps into a frame quickly and easily.

3,724,526

INSULATED OVERHEAD DOOR FOR TRUCKS AND THE LIKE

Carl A. Huprich, 630 N. Buys Road, Muskegon, Mich.

Filed Dec. 16, 1971, Ser. No. 208,737
Int. Cl. A47h *3/00*
U.S. Cl. 160—368 R 19 Claims



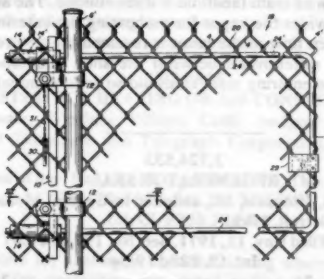
An overhead door assembly including a pair of spaced panels having insulating material located between the inside surfaces and holding the panels together. The insulating material is resilient to allow differential movement of the panels at least longitudinally of each other and preferably also laterally toward each other as the door is bent while moving between closed and open positions.

3,724,527

COLLAPSIBLE GATE FOR CHAIN-LINK FENCE GATEWAY

William H. Johns, Hudson, Ohio, assignor to United States Steel Corporation

Filed March 2, 1972, Ser. No. 231,280
Int. Cl. E06b *3/00*
U.S. Cl. 160—368 2 Claims



Device includes a U-shape frame mounted on a continuation portion of the fabric of a chain-like fence extending beyond one side of a supporting post of the fence into a gateway. The continuation portion of the fence fabric is the gate. The parallel leg members of the U-shape frame are disposed horizontally and are slidably received in two tubular members mounted on the fence on the opposite side of the supporting post. Movement of the parallel leg members inwardly of the tubular members causes the continuation portion of the fence fabric to collapse longitudinally to open the gateway and movement of the parallel leg members outwardly of the tubular members causes the gate portion of the fence fabric to expand longitudinally to close the gateway.

3,724,528

METHOD FOR MANUFACTURING OF SOUND KILLED STEEL INGOTS

Kiichi Narita, Itami; Takasuke Mori, Ashiya, and Takamichi Itoo, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe-city, Japan

Filed May 8, 1970, Ser. No. 35,842
Claims priority, application Japan, May 8, 1969, 44/35364
Int. Cl. B22d *27/20*
U.S. Cl. 164—58 4 Claims

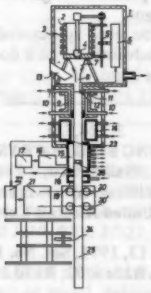
A high quality homogeneous sound killed steel ingot having a reduced quantity of negative segregation and of inverted V-shaped segregation zones is produced by adding a stirring agent to the molten steel during the solidification process and at a time period between the period during which the negative segregation section and the inverted V-shaped segregation zones are formed, and the period during which the V-shaped segregation zone is formed wherein the stirring agent is preferably an element, alloy, compound or mixture thereof of an element selected from the group of elements of Groups I-*a* or II-*a* of the Periodic Table or zinc, or the halides of an element of Groups I-*b*, III-*b*, IV-*a*, IV-*b*, VI-*a*, VII-*a*, or VIII.

3,724,529

PLANT FOR CONTINUOUS VACUUM CASTING OF METALS OR OTHER MATERIALS

Roger Louis Chaulet, Grenoble; Claude Pierre Albert Louis Guichard, Voiron; Pierre Lucien Menissier, Grenoble, and Jean-Claude Georges Soret, St. Egreve, all of France, assignors to Societe Anonyme Societe Industrielle de Combustible Nucleaire, Haute Savoie, France

Filed Oct. 13, 1969, Ser. No. 865,719
Claims priority, application France, Oct. 18, 1968, 68170599; Sept. 15, 1969, 6931355
Int. Cl. B22c *19/04*
U.S. Cl. 164—154 7 Claims



The invention relates to a method for continuous vacuum casting of metals or other materials and a plant for effecting

said method more particularly for the obtention of shapes and tubes.

The method applicable to plants comprising a spray means in the open air and a dynamic lock for emergence into air,comprised of chambers which are maintained under decreasing pressures by pumping devices of known types and are separated from each other by diaphragms, consists, on the one hand, in holding the static pressure of the metal on the shape or tube being formed at a constant value, for a given size with respect to the liquid meniscus size, so as to render the permissible difference between the cross-section of said shape or tube, when reaching the dynamic lock, and the cross-section of said diaphragms low enough for the rate of air admission to remain in all cases lower than the pumping rates of said pumping devices, and, on the other hand, in so selecting the cooling zone length, as a function of the suitably set rate of withdrawal of the moulded shape, that said shape will enter the spray means, when leaving the lock, at a constant, controlled temperature.

The invention is especially applicable to the obtention of uranium shapes or tubes.

3,724,530

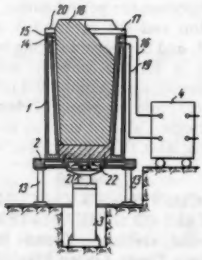
APPARATUS FOR ELECTROSLAG REMELTING OF METALS

Jury Vadimovich Latash, Vozdukhoflotsky prospekt, 87, kv. 14; Boris Izrailevich Medovar, bulvar Lesi Ukrainki, 2, kv. 8, and Vitaly Mikhailovich Baglai, ulitsa Semashko, 10, kv. 54/3, all of Kiev, U.S.S.R.

Filed Oct. 12, 1970, Ser. No. 79,940

Int. Cl. B22d *29/06, 27/02*

U.S. Cl. 164—252 **1 Claim**



The present invention relates to apparatus for electroslag remelting of metals.

The apparatus according to the invention is characterized by the fact that it has a device for lifting the deposited ingot to remove it from the mould, in which case the actuating member of the device passes through the aperture in the pan during the lift of the ingot.

The apparatus can be used substantially in production of large ingots having an advantage that it does not require a split mould for removing the ingot.

3,724,531

MOLD FOR CASTING SINGLE CRYSTAL ARTICLES

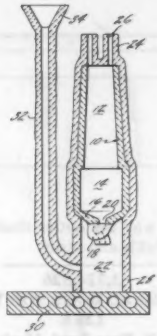
John S. Erickson, Wallingford; Patrick M. Curran, Manchester, and William A. Owczarski, Chesire, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Jan. 13, 1971, Ser. No. 106,077

Int. Cl. B22c *9/02*; B22d *25/06*

U.S. Cl. 164—361 **2 Claims**

A mold construction for use in making single crystal castings in which adequate metal area is provided for heat conduction to the chill plate during the solidification which



facilitates heat control to assure growth of a single crystal into and through the article cavity of the mold.

3,724,532

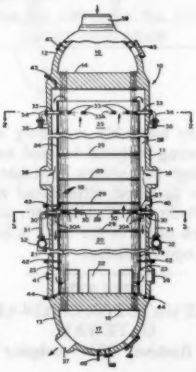
ONCE-THROUGH VAPOR GENERATOR

Theodore S. Sprague, Hudson, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 15,483, March 2, 1970, Pat. No. 3,635,287. This application Oct. 27, 1971, Ser. No. 192,963

Int. Cl. F28f *19/00*

U.S. Cl. 165—1 **7 Claims**



A method and apparatus for separately introducing an auxiliary feedfluid into a shell and tube type vapor generator when the flow of main feedfluid is discontinued. The auxiliary feedfluid provides the vapor for preheating the entering main feedfluid when flow of the latter is resumed thereby reducing temperature differentials between the shell and tube sheet metal and the entering main feedfluid so as to eliminate thermal shock.

3,724,533

REGENERATOR SEAL

Jack P. Hart, Hinsdale, Ill., assignor to General Motors Corporation, Detroit, Mich.

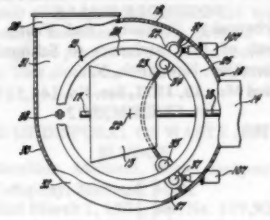
Filed Nov. 11, 1971, Ser. No. 197,674

Int. Cl. F28d *19/04*

U.S. Cl. 165—7 **3 Claims**

A rotary regenerator of the drum matrix type includes main seals engaging the matrix where it passes through the bulkhead of the regenerator. Each main seal includes a frame closely encircling the matrix including a housing extending across the hot side of the matrix. The matrix is guided and

driven by rollers in the main seal frame. The roller at the hot side of the matrix includes a hollow shaft with a roller near each end of the shaft to engage the matrix. Thermal insulation covers substantially all the exposed surfaces of the shaft and



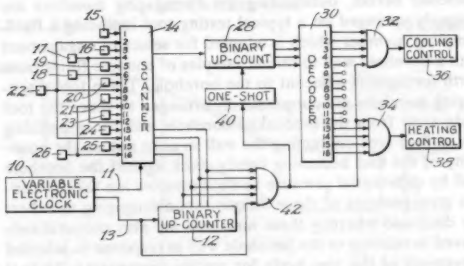
rollers from edge to edge of the matrix. The ends of the shaft are mounted in spherical bearings and lubricating and cooling oil is circulated through the shaft. This disclosure incorporated by reference to the parent application, now U.S. Pat. No. 3,638,716.

3,724,534

MULTIPLE ZONE CONTROL SYSTEM WITH PRIORITY OF SERVICE

Richard N. Weatherston, St. Paul, Minn., assignor to Weather-Rite, Inc., St. Paul, Minn.

Filed Nov. 26, 1971, Ser. No. 202,176
Int. Cl. F24f *3/00*
U.S. Cl. 165—12 **5 Claims**



A control system for heating and cooling a plurality of zones in which each zone has a thermostat. The total amount of heating and cooling supplied is controlled by an electronic scanning system which periodically samples each of the zone thermostats and adjusts the overall heating and cooling means according to the sum of the zone requirements. Zones which are assigned a greater importance are attached to more than one input of the scanning system so as to have a greater effect on the scanning system so as to receive priority of service.

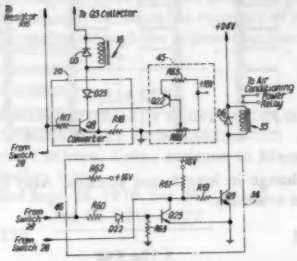
3,724,535

SYSTEM FOR HEATING OR AIR CONDITIONING

Said Sapir, Westlake Village, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 31,167, April 23, 1970. This application Jan. 10, 1972, Ser. No. 216,509
Int. Cl. F25b *29/00*
U.S. Cl. 165—26 **1 Claim**

A system for heating or air conditioning wherein provision is made for controlling fan speed and/or the heating and modulating valve in accordance with thermostat demand. The thermostat puts out a step function followed by a ramp for both on-off and proportional control. One valve may be used in series with another for each function. A logic gate is provided to override the speed control when the plenum is cold. Half speed is provided for a hot plenum even though there is no thermostat demand for heat. Two detectors are provided



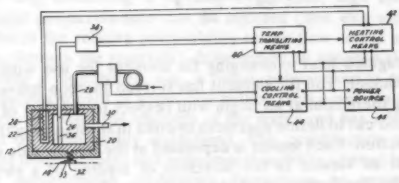
for plenum temperature. The same thermostat is used with both voltage sensitive and current sensitive circuits.

3,724,536

HEATING AND COOLING DEVICE

Brent Baxter, Salt Lake City, Utah, assignor to General Instrument Corporation, Newark, N.J.

Filed Aug. 14, 1970, Ser. No. 63,831
Int. Cl. F25b *29/00*
U.S. Cl. 165—27 **19 Claims**



An apparatus is provided which applies heat and cold to a device such as a semiconductor under test. A supporting structure is movable toward and away from the device under test and carries a housing which encloses a heat conductive member having a part which is engageable with the tested device. The housing also carries a heating means and a cooling means, both in heat transfer relation with said heat conductive member. One or the other of the heating and cooling means is rendered operative at a given time. Temperature sensing means monitors the temperature of the conductive member and transmits an appropriate signal to control means. The control means, in response thereto, causes more or less heat, or more or less cold, as the case may be, to be applied to the device under test.

ERRATUM

For Class 165—61 see:
Patent No. 3,724,235

3,724,537

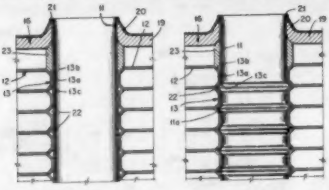
HEAT EXCHANGER WITH BACKED THIN TUBES

Herbert G. Johnson, 17 North Drexel Avenue, Havertown, Pa.

Filed Sept. 28, 1971, Ser. No. 184,483
Int. Cl. F28f *1/30;* **B21c** *37/22;* **B21d** *53/02*
U.S. Cl. 165—133 **9 Claims**

This application discloses a heat exchanger having thin lining tubes, as of plastic or metal, deformed against structural tubular backing and thermal exchange elements to provide extensive effective thermal transfer contact and support with

contoured securement between tubes and backing elements which obviates relative displacement and relieves differential



thermal change in length and stresses. Also the method of making the assembly.

3,724,538

HEAT EXCHANGER

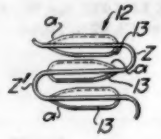
Terumoto Yamaguchi, and Yoshinao Amano, both of Anjo-shi, Japan, assignors to Nippondenso Co., Ltd., Kariya-shi, Japan

Filed Oct. 27, 1971, Ser. No. 193,117

Claims priority, application Japan, Dec. 27, 1970, 45/126115

Int. Cl. F28f *1/22*

U.S. Cl. 165—152 **7 Claims**



A corrugated heat exchanging fin element for use with a heat exchanger. The fin element has formed thereon louvers extending therefrom at an angle with respect to the flow of a coolant and cut to define apertures opened in substantially the same direction. Each louver is depressed at the trailing side of the louver as viewed in the direction of feeding of a strip material for the formation of the louvers so that the stresses produced in the material of the louvers at the time of manufacture is removed to enable the fin element to be free from arcuate bend from which the fin element otherwise suffers.

3,724,539

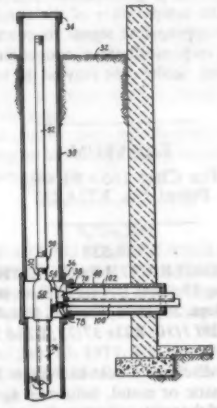
PIPE HANGER ADAPTER

Asa A. Payne, 307 East Canal Street, Chippewa Falls, Wis.

Filed March 23, 1971, Ser. No. 127,250

Int. Cl. E21b *33/03*

U.S. Cl. 166—89 **1 Claim**



A lift leg pipe supporting an adapter within a well casing T for connecting piping below the adapter to offset piping leading to a jet pump.

3,724,540

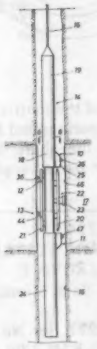
APPARATUS FOR DISENGAGING WELL TOOLS FROM BOREHOLE WALLS

Harold J. Urbanosky, Pearland, and Frank R. Whitten, Houston, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed May 18, 1971, Ser. No. 144,517

Int. Cl. E21b *33/12*

U.S. Cl. 166—100 **16 Claims**



In the several representative embodiments of the invention disclosed herein, outstanding tool-disengaging members are uniquely arranged on a typical testing tool including a fluid-sampling member which is adapted for selective engagement with a borehole wall to obtain samples of connate fluids from earth formations adjacent to the borehole. These tool-disengaging members are cooperatively arranged to space the tool body away from the mudcaked borehole wall for minimizing the surface area contacting the wall so as to reduce the possibility of the tool becoming tightly stuck against the borehole wall by differential pressure as fluid samples are taken. Various arrangements of these unique tool-disengaging members are disclosed whereby these members are also cooperatively moved in relation to the borehole wall in response to selected movement of the tool body for readily disengaging the tool from the wall when it is to be moved away from its testing position.

3,724,541

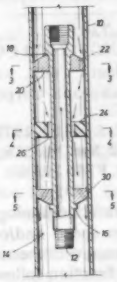
SAFETY DEVICE FOR GAS LIFT WELL

David B. Curry, P.O. Box 405, Woodville, Tex.

Filed March 22, 1971, Ser. No. 126,616

Int. Cl. E21b *33/00*

U.S. Cl. 166—224 **8 Claims**



For use in a well where production is sustained through gas lift methods, an apparatus which shuts in the well on

catastrophic failure. The apparatus includes a set of spaced, slidably mounted pistons carried on the production tubing string. Openings in the pistons permit gas flow down through the pistons. When gas flow is upward in the annulus, the lower piston is lifted upwardly and contacts the centrally located piston. The pair slide upwardly against the topmost piston, which is fixedly mounted. When pressed together, the openings through the pistons do not permit continued gas flow in the annulus. This closes the annulus to gas flow.

3,724,542

METHOD OF DISPOSAL OF WASTE ACTIVATED SLUDGE

Charles E. Hamilton, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed March 1, 1971, Ser. No. 119,927
Int. Cl. E21b *43/22, 43/26*
U.S. Cl. 166—246 5 Claims

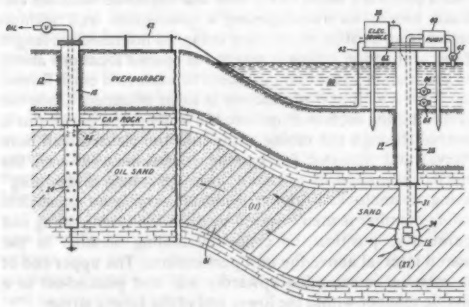
Activated sludge from waste disposal operations has been found to grow utilizing hydrocarbons from petroleum or oil shale in an anaerobic environment and producing gas containing an unexpected preponderance of hydrocarbons, particularly methane. The invention provides a method for disposing of waste activated sludge with the concurrent production of useful fuel.

3,724,543

ELECTRO-THERMAL PROCESS FOR PRODUCTION OF OFF SHORE OIL THROUGH ON SHORE WALLS

Christy W. Bell, Berwyn, and Charles H. Titus, Newtown Square, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed March 3, 1971, Ser. No. 120,592
Int. Cl. E21b *43/00*
U.S. Cl. 166—248 10 Claims



The flow of oil from an undersea oil-bearing formation to an on-shore well is induced by the steps of locating a relatively small anode in a cavity at an approximately medial elevation of the formation at an off-shore location preferably beyond the reservoir of oil, injecting saline water into that cavity, raising the electric potential of the anode with respect to a cathode in the vicinity of an off-shore well, and withdrawing oil from the well.

3,724,544

SECONDARY RECOVERY METHOD

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed June 21, 1971, Ser. No. 155,311
Int. Cl. E21b *43/22, 43/27*
U.S. Cl. 166—271 23 Claims

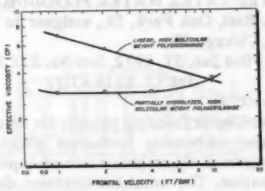
Significant improvement in the recovery of hydrocarbons from a subterranean hydrocarbon-bearing formation containing acid-soluble components is accomplished by injecting into the formation via an injection well drilled into a formation communicating with an adjacent producing well and containing acid-soluble components which may or may not have water-sensitive clays and shales included therein, an aqueous acidic solution of a phosphate ester of prescribed formula whereupon the acid component reacts with the acid-soluble components of the formation creating passageways or enlarging existing passageways thus facilitating the flow of fluids therein and the phosphate ester prevents post-precipitation of dissolved salts and thereby increases the recovery of hydrocarbons from the formation through the adjacent producing well.

3,724,545

ECONOMICAL MOBILITY CONTROL IN OIL RECOVERY PROCESSES

Bruce L. Knight, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Sept. 28, 1970, Ser. No. 76,140
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 13 Claims



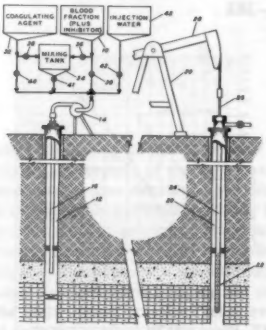
Improved mobility control in secondary and tertiary recovery processes is obtained by injecting at least two slugs into the reservoir, one slug designed to effect a permeability reduction and the other slug containing an agent which more effectively increases the fluid viscosity. For example, an aqueous slug containing a partially hydrolyzed, high molecular weight polyacrylamide can be injected (this slug efficiently reduces the relative permeability to the flow of the aqueous slug through the reservoir), followed by an aqueous slug containing a biopolymer, e.g., a linear polysaccharide having a molecular weight of about one million (this agent more effectively increases the viscosity of the water and has a lesser effect on permeability reduction). This combination of slugs gives more efficient and economical mobility control in flooding subterranean oil-bearing formations to recover oil therefrom.

3,724,546

BLOOD FLOOD

Harley Y. Jennings, Jr., Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 11, 1971, Ser. No. 105,192
Int. Cl. E21b *43/16*
U.S. Cl. 166—274 7 Claims



A method of using whole animal blood, or a selected fraction of it, is disclosed as a suitable fluid for assisting recovery of petroleum from a reservoir. Bovine or other animal blood recovered from meat slaughtering is pumped into an oil reservoir from an injection well. It is injected either as a solution with flooding water or followed by water after injection in un-

diluted form. If desired a clotting retardant, such as citric acid or EDTA (ethylenediaminetetraacetic acid) may be added to the blood to prevent coagulation before contacting fluids in the reservoir. Improved oil recovery from the reservoir over straight water flood is believed to be due to the oil-to-water mobility ratio increase by the addition of blood to the drive fluid. Both blood's high natural viscosity and the ability to polymerize its fibrinogen to form fibrin upon contact with the reservoir rock and fluids are contributing factors. At the same time, its colloidal content, cells and platelets, either as a fraction of, or in the whole blood, tend to plug larger permeability channels of the reservoir rock and thereby inhibit bypassing of petroleum by flood water used to drive reservoir fluids to one or more producing wells.

3,724,547

INVERTED LATEX WATER FLOODING METHOD

Lawrence L. Bott, Oak Park, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Jan. 31, 1972, Ser. No. 222,301
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 **12 Claims**

An improved water flooding process for recovering oil from a subterranean oil-bearing formation which comprises introducing a water-in-oil emulsion into an input well penetrating the formation. The emulsion contains dispersed therein from 0.01 to 35 percent by weight of a finely-divided water-soluble vinyl addition polymer and which is capable of being inverted in water whereby the water-soluble vinyl addition polymer is released into the water as a solution.

3,724,548

WATERFLOODING METHOD USING MODIFIED STARCH GRANULES

Harry W. Parker, Lubbock, Tex., and John W. Marx, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 17, 1971, Ser. No. 116,216
Int. Cl. E21b *43/25*
U.S. Cl. 166—275 **7 Claims**

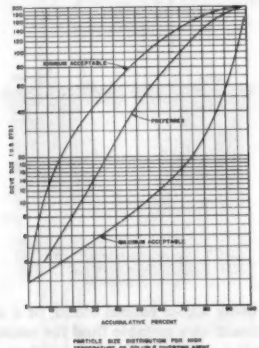
Adding modified starch granules of a preselected size to the flood water for waterflooding a hydrocarbon containing formation and improving the flood front of said flood water.

3,724,549

OIL SOLUBLE DIVERTING MATERIAL AND METHOD OF USE FOR WELL TREATMENT

Walter R. Dill, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 1, 1971, Ser. No. 111,387
Int. Cl. E21b *33/138*, *43/27*
U.S. Cl. 166—282 **17 Claims**



PARTICLE SIZE DISTRIBUTION FOR HIGH TEMPERATURE, OIL SOLUBLE DIVERTING AGENT

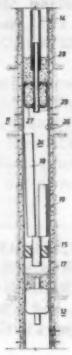
The present invention relates to an oil soluble bridging agent for diverting oil well treating fluids to less permeable portions of an oil-producing subterranean formation having temperatures up to about 360°F.

3,724,550

METHODS FOR RECOMPLETING WELLS

C. P. Lanmon, II, Friendswood, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Sept. 28, 1971, Ser. No. 184,419
Int. Cl. E21b *33/00*
U.S. Cl. 166—285 **9 Claims**



As a preferred mode of the new and improved methods disclosed herein for recompleting a production well without removing an existing production string, an intermediate length of the production tubing is severed at spaced locations above the production packer and adjacent to a selected earth formation from which new production is to be obtained. Once the severed tubing section drops into the well bore, a perforator is lowered through the tubing string into the cleared well bore interval and actuated for gaining communication with the selected formation. A so-called "through-tubing bridge plug" having an unblocked tubular mandrel carrying an expansible sealing member is then lowered through the tubing string and operated to position the expanded sealing member in the cleared interval above the new perforations. The upper end of the mandrel is extended upwardly into and packed-off in a suitable manner within the lower end of the tubing string.

3,724,551

SECONDARY RECOVERY OF PETROLEUM

Edwin S. Troscinski, Houston, and James R. Stanford, Sugar Land, both of Tex., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Jan. 6, 1972, Ser. No. 215,897
Int. Cl. E21b *33/138*
U.S. Cl. 166—295 **9 Claims**

This invention relates to the recovery of petroleum, and in particular, involves a process for reducing the amount of water recovered from a producing well. This reduction in water is accomplished by:

A. introducing a brine solution containing from 0.5 to 5.0 percent by weight of a surfactant into said producing well which penetrates said formation; then;

B. introducing a water-in-oil emulsion into said producing well which penetrates said formation, and allowing the water-in-oil emulsion to be left static for from 10 to 72 hours; said emulsion containing dispersed therein from 0.01 to 35 percent by weight of a finely-divided water-soluble vinyl addition polymer and which is capable of being inverted in water whereby the water-soluble vinyl addition polymer is released into the water as a solution.

3,724,552
WELL TREATING METHOD TO REMOVE PARAFFIN DEPOSITION

Earl S. Snavely, Jr., Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,122
Int. Cl. E21b *21/00, 43/25*
U.S. Cl. 166—304 **10 Claims**

This specification discloses a method of treating a well having an oil column therein and penetrating an oil-containing subterranean formation to dissolve paraffin deposits from the well and the formation. There is injected into an upper end of the well an aqueous solution of a water-soluble compound that has a greater specific gravity than the oil in the well, which water-soluble compound decomposes into carbon disulfide under conditions existing in a lower portion of the well. The aqueous solution of the water-soluble compound settles downwardly through the oil in the well to the lower portion thereof where it decomposes thereby releasing carbon disulfide which then dissolves paraffins from the well and formations communicating therewith. Water-soluble compounds suitable for use in accordance with the method of this invention are selected from the class consisting of trithiocarbonates, dithiocarbamates, and xanthates.

3,724,553
PARAFFIN WELL TREATMENT METHOD

Earl S. Snavely, Jr., Arlington, Tex.; Theodore A. Bertness, Whittier, Calif., and Richard L. Morris, Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

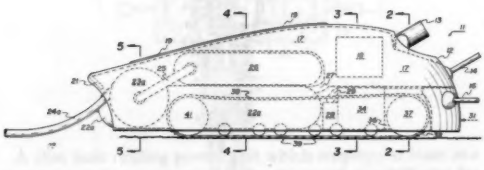
Filed Nov. 18, 1971, Ser. No. 199,963
Int. Cl. E21b *21/00, 43/25;* **C09k** *3/00*
U.S. Cl. 166—304 **14 Claims**

This specification discloses a method of treating a well having an oil column therein and penetrating an oil-containing subterranean formation to dissolve paraffin deposits from the well and the formation. There is injected into the well a thermally stable emulsion in a salt-free environment of a solvent for paraffins in a continuous aqueous phase. The emulsion is stable at the temperatures existing in the well and subterranean formation but subject to being broken by contacting the aqueous phase with salt. The emulsion has a greater specific gravity than the oil forming the oil column and settles downwardly therethrough to a lower location of the well. Salt having a greater specific gravity than the oil is injected into the well either prior to or subsequent to the injection of the emulsion into the well. The salt settles downwardly through the oil column to a lower location of the well and mixes with the emulsion, thereby breaking the emulsion and releasing the solvent to dissolve the paraffins.

3,724,554
FIRE FIGHTING SYSTEM

Paul D. Rupert, and Raymond D. Rupert, both of 5703 Beaumont Avenue, La Jolla, Calif.

Filed May 27, 1971, Ser. No. 147,582
Int. Cl. A62c *3/00*
U.S. Cl. 169—2 A **3 Claims**

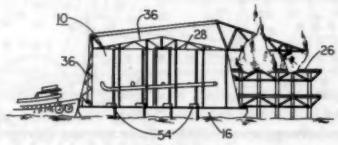


A fire fighting system including a plurality of shielded vehicles which can be remote controlled and are propelled on tracks containing a water tank shield surrounding the remote controlled equipment or an operator and a pair of sweeping nozzles for discharging foam into the fire area together with a remote supply hose reel for reeling out hose as it advances, the hose being connected to a water supply; a TV camera with suitable transmitting equipment, and high pressure air tanks for powering the foamed water to the fire area together with a plurality of hurricane fans being supplied with a fogging agent for blowing fog into the fire area.

3,724,555
FLOATING FIRE EXTINGUISHING APPARATUS AND CATCH BASIN

Randall J. Chiasson, 808 Jefferson St; Ronald G. Bourg, 114 Thorobred Drive, and Tilton J. Arceneaux, 1514 Lynn Avenue, all of Thibodaux, La.

Filed Feb. 29, 1972, Ser. No. 233,384
Int. Cl. A62c *3/00*
U.S. Cl. 169—2 R **5 Claims**

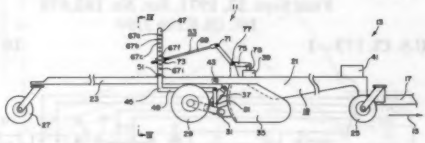


An enclosing floating structure, having an openable end, and pushable by a tug to enclose a burning offshore oil rig through the openable end which is then closed to smother a fire. Pumps mounted on the structure spray water over the burning rig to assist in putting out a fire and to cool the rig. Interconnected pressure relief vents are provided to relieve internal pressures. The annular space defined by the enclosing floating structure in the water for a depth equal to the draft of said structure provides a catch basin for the containment of liquid hydro-carbon liquids. Provision is made for removing pollutants from the catch basin before its capacity is exceeded or the openable end is opened.

3,724,556
FILL MATERIAL COMPENSATOR FOR AN AUTOMATIC HYDRO-MECHANICAL LAND LEVELER

John B. Servatius, P.O. Box 26, East Prairie, Mo.

Filed Oct. 15, 1971, Ser. No. 189,609
Int. Cl. E02f *3/76*
U.S. Cl. 172—4.5 **5 Claims**



Control apparatus including an action booster than can be attached to typical land levelers of the type having an elongated center articulated frame suitably supported at its ends and provided intermediate its ends with a scraper blade fixedly attached thereto and further supported adjacent the center thereof by automatic hydro-mechanical controlled wheels to maintain the height of the blade at a preset relationship with respect to a straight line extending between the support structure adjacent the ends thereof to effect land leveling as it is caused to travel over the surface of the earth. The apparatus boosts the response of the drive structure for the intermediate or blade support wheels to the elevation of the irregularities resulting in an optimum refinement of the leveling action thereof which is controlled by the relationship of the compacted ground contact point of the blade support wheels and a line between the compacted ground contact points of the front

and rear support structure. The responsive action compensates for loose material in fill areas and for the problem that fill material would not heretofore spill under the blade properly to fill low places to the exact height of the blade.

3,724,557

APPARATUS ADAPTED TO BE COUPLED TO A TRACTION VEHICLE SERVING FOR THE MAINTENANCE OR CONSTRUCTION OF WATER-BOUND ROADS

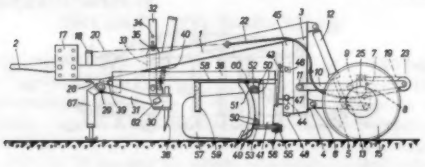
Marcel Boschung, Schmitten, and Hans Gisler, Bern, both of Switzerland, assignors to Firma Marcel Boschung, Schmitten, Switzerland

Filed July 15, 1970, Ser. No. 54,967

Claims priority, application Switzerland, July 22, 1969, 11189/69

Int. Cl. A01b *49/02*

U.S. Cl. 172—197 **4 Claims**



An apparatus capable of being coupled to a traction vehicle and serving for the construction or maintenance of water-bound roads, which is of the type comprising a main support bearing upon an undercarriage. This equipment also incorporates a pavement breaker beam and a levelling plate, both of which are pivotably coupled with the main support independently of one another for movement about at least one axis extending transverse to the lengthwise axis of the apparatus. According to the invention the pavement breaker beam and the levelling plate can each be arrested independently of one another at a respective predetermined spacing with respect to the main support, and further, wherein the rear end of the main support is coupled by means of a guide mechanism with the undercarriage for the purpose of regulating the height of this end above the ground.

3,724,558

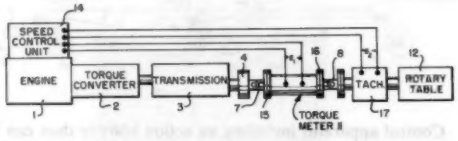
APPARATUS FOR CONTROLLING THE ROTARY SPEED OF A DRILL

Herbert A. Rundell, Houston, and Robert W. Pittman, Bellaire, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 22, 1971, Ser. No. 182,678

Int. Cl. E21b *3/04*

U.S. Cl. 173—1 **10 Claims**



The rotary speed of a rotary drive system, including a rotary engine, for a drill in a well is maintained at a predetermined value and is sensed by a tachometer. An electrical signal from the tachometer is converted to a pneumatic signal by an electro-pneumatic transducer which is applied to a receiver-controller receiving a supply of filtered air at a predetermined pressure. When the electrical signal from the tachometer changes due to a change in the rotary speed of the rotary drive system from the predetermined value, the pneumatic output from the receiver controller changes accordingly until the rotary speed of the rotary drive system is once again at the predetermined value. The pneumatic output from the receiver controller remains at the pressure which returned the rotary speed to its predetermined value.

In achieving speed control, the pneumatic output from the receiver controller is effectively amplified by a booster relay receiving filtered air at a second predetermined pressure to provide a pneumatic signal. The pneumatic signal from the booster relay is applied to the throttle of the rotary engine to control the engine's rotary speed and hence the rotary speed of the rotary drive system and drill.

3,724,559

DRILL BOOM WITH FEED DIRECTION SENSING AND CONTROL

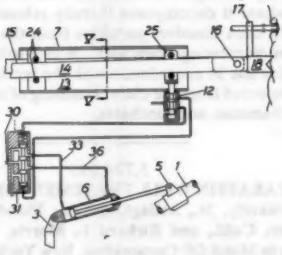
Axel Stromnes, Tunabro, Sweden, assignor to Atlas Copco Aktienbolag, Nacka, Sweden

Filed Feb. 17, 1971, Ser. No. 116,013

Claims priority, application Sweden, Feb. 19, 1970, 2091/70

Int. Cl. E21c *5/11*

U.S. Cl. 173—4 **11 Claims**



A drill boom consisting of a telescopically extendable boom leg, which is pivotably mounted on a rotatable bracket. A rock drill is attached to a pivotable boom head at the opposite end of the boom leg. The boom head is pivotable about an axis which is parallel to the pivot axis of the boom leg. The rock drill is fed by a pivoting force and a length changing force simultaneously acting on the boom. A control system is provided to continuously sense and correct the rock drill position during drilling whereby the corrections is accomplished by adjusting of the composite feeding force direction.

3,724,560

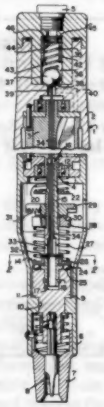
AUTOMATIC THROTTLE SHUT-OFF POWER TOOL

David W. Tibbott, Phillipsburg, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Sept. 8, 1971, Ser. No. 178,553

Int. Cl. B25b *23/14*

U.S. Cl. 173—12 **10 Claims**



A fluid-operated rotary power tool having a motor supply valve which is moved into engagement with a movable valve

sleeve in response to a clutch reaching a predetermined torque load, thereby closing the valve and stopping the motor. The movable valve sleeve is normally urged away from the valve. When the movable valve sleeve is engaged by the valve, it is held there by a differential pressure to keep the valve closed until the valve returns to its normally closed position.

3,724,561

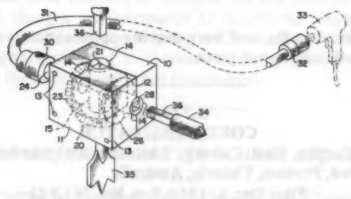
MULTIPLE TOOL DRIVING UNIT

Frederic Price Merrels, 5609 Wilson Lane, Bethesda, Md.

Filed Sept. 9, 1971, Ser. No. 178,919

Int. Cl. B25b *21/00*

U.S. Cl. 173—50 **11 Claims**



A compact multiple tool driving unit driven by a motor remote from, but permanently attached to it, so that a minimum of distance is required between it and the work to be performed. Alternatively, a separate portable power transmitting unit may be used, having an input connection allowing the unit to be driven by a portable hand drill or the like. The unit possesses a plurality of output or tool driving connections which are employed to drive drill bits, screwdrivers and other similar tools. Because of its compact construction, the device enables the user to perform a variety of different operations in tight places where present tools cannot operate, and also to perform a variety of different operations without the necessity of stopping to change tools.

3,724,562

SLIM HOLE DRILLING ELECTRIC POWER UNIT

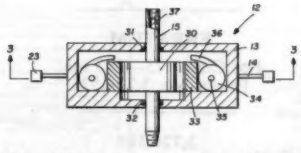
John H. Striegler, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 65,177, Aug. 19, 1970, Pat. No. 3,670,832.

This application Feb. 4, 1972, Ser. No. 223,484

Int. Cl. E21b *3/02*

U.S. Cl. 173—57 **2 Claims**



A slim hole drilling power unit which employs at least one electric motor in mechanical connection with the drill pipe for rotating the drill pipe and moving with same as it advances toward and away from the wellbore. The power unit contains its own fan means so that no cooling air supply hose to said power unit is necessary.

3,724,563

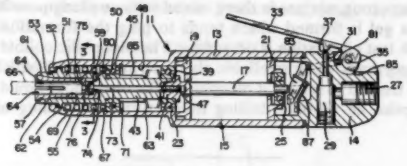
COLLET CHUCK OPERATED BY THROTTLE CONTROL FOR ROTARY POWER TOOL

John L. Wickham, Glen Arm; Lee W. Ramstrom, Joppa; Albert G. Wordsworth, and Robert A. Meloni, both of Baltimore, all of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed March 8, 1971, Ser. No. 121,731

Int. Cl. B23b *31/20*

U.S. Cl. 173—163 **16 Claims**



A portable rotary power tool including a housing having a vane-type pneumatic motor disposed therein. The motor is coupled to an output shaft rotatably supported within the housing. A collet is keyed within the shaft and is adapted to releaseably grip a tool bit. A throttle valve controls operation of the motor and is operated by a pivoted lever mounted on the housing. When the lever is moved in a direction opposite to that required for operation of the motor, the collet is positively released from the bit.

3,724,564

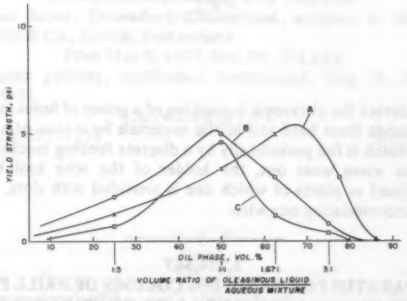
TECHNIQUE FOR CONTROLLING LOST CIRCULATION

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 12, 1971, Ser. No. 198,357

Int. Cl. E21b *21/04, 33/13, 43/00*

U.S. Cl. 175—72 **9 Claims**



This specification discloses a method of controlling lost circulation in drilling operations. In carrying out the method of the invention, an aqueous mixture of a dispersing agent, an inert particulate material, and a water dispersible oleophilic colloid is introduced into the well. This aqueous mixture is circulated down the well and into the vicinity of a formation into which lost circulation is occurring. The aqueous mixture is then mixed with an oleaginous liquid and a gel is formed which tends to plug the formation into which lost circulation is occurring. The oleophilic colloid may be a normally water swellable clay such as bentonite which has been treated to render it oleophilic. The oleaginous liquid may comprise an oil-base drilling fluid utilized in drilling of the well. The inert material may be a weighting material such as barite.

3,724,565

METHOD OF CONTROLLING LOST CIRCULATION

John Kelly, Jr., Arlington, Tex., assignor to Mobil Oil Corporation

Filed Nov. 12, 1971, Ser. No. 198,247
Int. Cl. E21b 21/04, 33/13, 43/00
U.S. Cl. 175—72 9 Claims

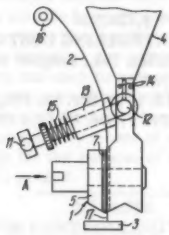
This specification discloses a method of controlling lost circulation in drilling operations. In carrying out the method of the invention, an aqueous mixture of a dispersing agent and a water dispersible oleophilic colloid is introduced into the well. This aqueous mixture is circulated down the well and into the vicinity of a formation into which lost circulation is occurring. The aqueous mixture is there mixed with an oleaginous liquid and a gel is formed which tends to plug the formation into which lost circulation is occurring. The oleophilic colloid may be a normally water swellable clay such as bentonite which has been treated to render it oleophilic. The oleaginous liquid may comprise an oil-base drilling fluid utilized in drilling of the well.

3,724,566

DEVICE FOR ULTRASONIC BROACHING OF A GROUP OF HOLES

Filipp Georgievich Staros, Belgradskaya ulitsa, 18, kv. 226, Leningrad, U.S.S.R.

Filed Sept. 17, 1971, Ser. No. 181,411
Int. Cl. E21c 3/02
U.S. Cl. 175—108 3 Claims



A device for ultrasonic broaching of a group of holes in articles made from hard and brittle materials by means of a wire tool which is fed periodically by a discrete feeding mechanism as the wires wear out, the holder of the wire tool being fashioned as plates of which one is provided with slots, each slot accomodating one wire.

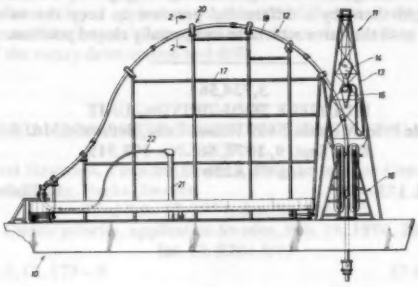
3,724,567

APPARATUS FOR HANDLING COLUMN OF DRILL PIPE OR TUBING DURING DRILLING OR WORKOVER OPERATIONS

Eugene A. Smitherman, 821 Esperson Building, Houston, Tex.

Division of Ser. No. 93,840, Nov. 30, 1970, Pat. No. 3,667,554, which is a continuation of Ser. No. 859,634, Sept. 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 685,686, Nov. 24, 1967, abandoned. This application June 5, 1972, Ser. No. 259,908
Int. Cl. E21b 7/00, 19/00
U.S. Cl. 175—203 9 Claims

An apparatus for removing or installing a column of drill pipe or tubing relative to a well bore during drilling or workover operations wherein the drill string is moved from the well bore preferably in one continuous piece without breaking it into shorter sections, and is moved in an upwardly and radially outwardly curved path from the well bore to a substantially horizontal attitude for storage preferably in a generally circular configuration on the ground or support means for later return to the well bore moving approximately along the same path, and as one piece.

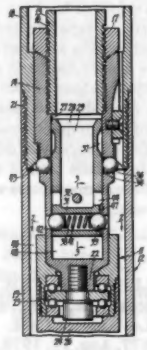


3,724,568

CORE DRILL LATCH

Horst Koepke, East Coburg, Australia, assignor to Mindrill Limited, Preston, Victoria, Australia

Filed Dec. 6, 1968, Ser. No. 781,743
Claims priority, application Australia, Dec. 6, 1967, 30,828/67
Int. Cl. E21b 9/20, 25/00
U.S. Cl. 175—247 6 Claims



A core barrel inner tube assembly, having a latching mechanism which can latch the assembly into the drill string to prevent upward movement of the assembly relative to the string as it is lowered down a drill hole and which can be released by the application of drilling fluid pressure to allow normal operation during drilling.

ERRATUM

For Class 175—293 see:
Patent No. 3,724,576

3,724,569

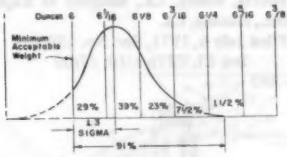
METHOD AND APPARATUS FOR CONTROLLING PRODUCT CHARGE WEIGHTS

Stewart B. Blodgett, 12322 Mossycup Dr., Houston, Tex.

Division of Ser. No. 775,858, Nov. 14, 1968, Pat. No. 3,643,752. This application Oct. 29, 1970, Ser. No. 85,271
Int. Cl. G01g 15/00
U.S. Cl. 177—1 5 Claims

A method of controlling the weights of product charges and reducing product giveaway is provided wherein a predeter-

mined percentage of charges are deliberately held underweight so that a high percentage of the charges are delivered at a weight near the minimum acceptable level. The underweight charges are then brought up to weight by adding additional product so that all charges are delivered at weights above the minimum. A method for maintaining the predetermined percentage of underweight charges is also provided wherein the total number of charges and the number of underweight charges are compared to determine whether the predetermined percentage is being maintained and a resultant control signal produced to increase or decrease the amount fed where the percentage is not maintained.

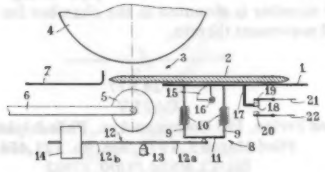


3,724,570

POSTAL METER WITH LETTER WEIGHT CHECKING DEVICE

Gabriel Chenut, 68 rue Bourdignon, Saint Maur, France

Filed June 5, 1972, Ser. No. 259,673
Claims priority, application France, June 7, 1971, 7120455
Int. Cl. G01g *23/38, 19/52*
U.S. Cl. 177—4 **6 Claims**



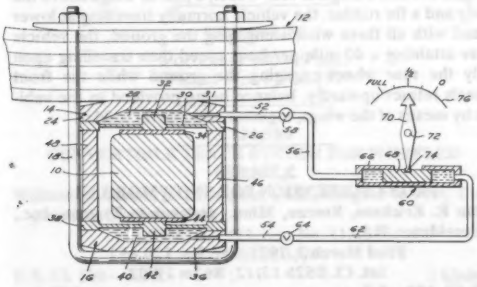
Postal meter comprising a pre-set weigher and a pre-set postage printer and an alarm means to prevent printing if a letter weighs more than the pre-set weight.

3,724,571

HYDRAULIC LOAD INDICATING DEVICE

John E. Thorn, Chigwell Row, and Alan A. Selman, Southend-on-Sea, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed June 25, 1970, Ser. No. 49,692
Claims priority, application Great Britain, Aug. 26, 1969, 42,425/69
Int. Cl. G01g *19/10, 5/00*
U.S. Cl. 177—141 **5 Claims**



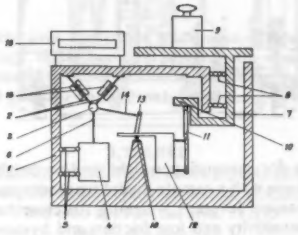
A hydraulic device is interposed between the vehicle spring and a wheel support member of a motor vehicle suspension system. The device contains an expansible chamber that changes its volume in proportion to the vehicle loading. The chamber volume is sensed by an indicator that gives a reading to the vehicle operator of the load being carried by the vehicle.

3,724,572

ELECTRONIC MEASURING APPARATUS FOR MEASURING MASSES AND FORCES

Kaspar Saner, Dubendorf, Switzerland, assignor to Wirth, Gallo & Co., Zurich, Switzerland

Filed May 9, 1972, Ser. No. 251,651
Claims priority, application Switzerland, Aug. 2, 1971, 11358/71
Int. Cl. G01g *3/14*
U.S. Cl. 177—210 **6 Claims**



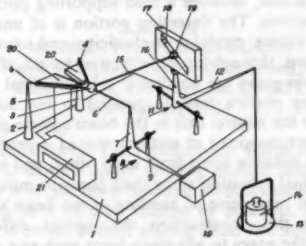
Two pretensioned vibrating strings are respectively stressed and stress-relieved by a force to be measured, said force being applied through a compensating lever incorporating an arm whose effective length varies as a function of force applied to maintain linearity.

3,724,573

ELECTRONIC MEASURING APPARATUS FOR MEASURING MASSES AND FORCES

Kaspar Saner, Dubendorf, Switzerland, assignor to Wirth, Gallo & Co., Zurich, Switzerland

Filed May 9, 1972, Ser. No. 251,652
Claims priority, application Switzerland, Aug. 4, 1971, 11505/71
Int. Cl. G01g *3/14*
U.S. Cl. 177—210 **3 Claims**



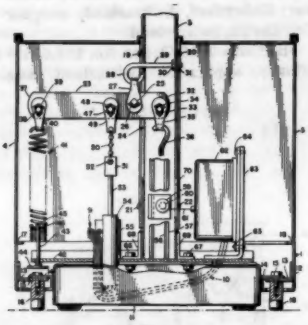
Two pretensioned vibrating strings are respectively stressed and stress-relieved by a force to be measured, said force being applied through an adjusting member by which the angle of force application can be varied to compensate initial errors of the apparatus.

3,724,574

WEIGHING AND HEIGHT MEASURING DEVICE

William Y. Hutchinson, Chicago, and Walter P. Kushmuk, Niles, both of Ill., assignors to Continental Scale Corporation, Chicago, Ill.

Division of Ser. No. 83,924, Oct. 26, 1970, Pat. No. 3,667,561.
This application Dec. 13, 1971, Ser. No. 207,329
Int. Cl. G01g 3/02, 7/02, 19/50
U.S. Cl. 177—210 6 Claims



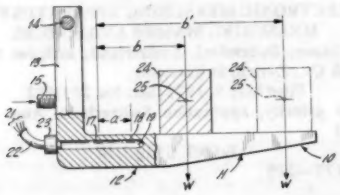
A device for measuring weight and/or height especially adapted for use with a remote digital read-out system comprising a mechanical leverage weighing structure having a high degree of sensitivity and low friction and hysteresis coupled with a compatible electronic measuring system and/or a height measuring means compatible with said system.

3,724,575

FORCE DETECING AND EVALUATING APPARATUS

Ali Umit Kutsay, 3520 Lewis Road, Newton Square, Pa.

Filed Jan. 24, 1972, Ser. No. 220,082
Int. Cl. G01g 3/14, 21/14, 3/10
U.S. Cl. 177—211 10 Claims



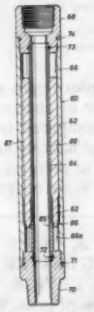
A bending type load detecting beam, preferably of cantilever construction, includes a load supporting portion and a detecting portion. The detecting portion is of uniform area moment of inertia, modulus of elasticity, and neutral axis of bending stress throughout its effective length. Electric-resistance strain gages are bonded to a longitudinal surface of the detecting portion initially parallel to but substantially spaced from the neutral axis in the beam's plane of bending. The gages are mounted at stations spaced a predetermined longitudinal distance apart from each other, and are aligned for longitudinal actuation along their common mounting line, making them responsive to bending of the beam's detecting portion. By this construction the mutual difference in response of the gages to any given force such as a weight applied via the loading portion, is rendered constantly proportional to the magnitude of the force, irrespective of the shape, center of gravity or position of the applied weight on the loading portion. The constantly proportional differential gage response may be metered by electrical means calibrated to indicate or record directly the actual magnitude of the applied force. The invention also includes apparatus employing a plurality of beams of the above type, instrumentally interconnected, for weighing materials not readily supportable on a single beam.

3,724,576

WELL IMPACT TOOLS

Preston C. Roberts, Bourg, La., assignor to Kajan Specialty Company, Inc., Houma, La.

Filed July 6, 1971, Ser. No. 159,878
Int. Cl. E21b 1/10, 17/00
U.S. Cl. 175—293 9 Claims



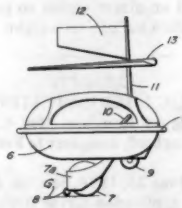
A well tool for use with a jarring tool comprising an inner tubular member concentrically disposed in an outer cylindrical casing member, leaving an elongated annular chamber therebetween. Adaptors are provided at each end of the casing member for connection in a pipe string. An annular hammer member is mounted in the chamber for limited longitudinal movement therein.

3,724,577

CAFLY

Ferdinand Ferino, 193 Cottoman Ave., Philadelphia, Pa.

Filed March 5, 1971, Ser. No. 121,466
Int. Cl. B62d 35/00, 37/02
U.S. Cl. 180—1 FV 4 Claims



A vehicle for traveling upon the ground, the vehicle including a pair of front wheels mounted in tandem side by side arrangement and a singular rear wheel, a pair of wings above the body and a fin rudder, the vehicle normally travelling at lower speed with all three wheels engaging the ground, the vehicle after attaining a 40 mile per hour speed then travelling upon only the rear wheel engaging the ground while the front wheels retract upwardly, balance being provided to the vehicle by means of the wings, together with the fin rudder.

3,724,578

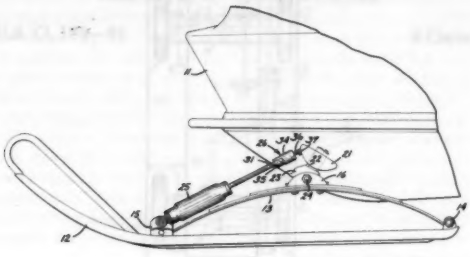
FRONT SUSPENSION FOR SNOWMOBILES

Albin R. Erickson, Roseau, Minn., assignor to Textron, Inc., Providence, R.I.

Filed March 3, 1971, Ser. No. 120,657
Int. Cl. B62b 13/12; B62m 27/02
U.S. Cl. 180—5 R 6 Claims

A suspension system for the front running skis of a snowmobile. Each ski is yieldingly mounted by leaf springs to a steer-

ing rod on a snowmobile, and is capable of guiding the vehicle as well as compensating for terrain irregularities. A piston-cylinder shock absorber is pivotally connected at its lower end



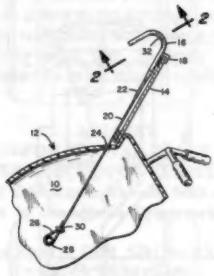
to the ski, and the upper end is connected to the snowmobile body by means of a ball and socket coupling to dampen oscillatory movement of the ski.

3,724,579

SAFETY DEVICE FOR ALL TERRAIN VEHICLE

Robert V. Albertson, 2100 Shady Wood Road, Minneapolis, Minn.

Filed Nov. 5, 1970, Ser. No. 87,109
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **3 Claims**



A safety device for an all terrain vehicle, such as a snowmobile, which protects the vehicle and its operator from injury which may occur when the vehicle strikes an obstacle such as fence wire, low branches or the like. The device comprises a hook-shaped member secured to the upper edge of the windscreen with the hook opening pointing toward the front of the vehicle. A cable is fastened to the shank of the hook and passes through the hood of the vehicle at a point forward of the windscreen and is secured to the frame of the vehicle.

ERRATUM

For Class 180—9 see:
Patent No. 3,724,397

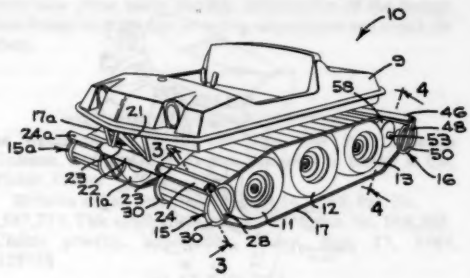
3,724,580

CONVERTIBLE TRACK SYSTEM FOR WHEELED VEHICLE

William J. Adams, Jr., San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 8, 1971, Ser. No. 113,528
Int. Cl. B62d *55/04*
U.S. Cl. 180—9.2 R **2 Claims**

An all-terrain vehicle having sets of tandem drive wheels on each side thereof can be converted to a track type vehicle with flanged idlers mounted in front of and behind each set of tandem drive wheels and an endless belt type track on each side of the vehicle extending around one set of tandem drive wheels and idlers. Tires on the tandem drive wheels drive the track by normal traction engagement and distribute the weight



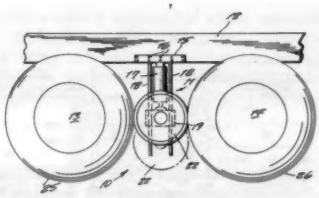
of the vehicle over the entire track area. Conversion from wheel to track operation does not require changes in the power transmission, all-wheel drive, suspension, or steering controls and gives the vehicle mobility in deep, powder snow.

3,724,581

TANDEM AXLE TRACTION EQUALIZER

Harold Terrell, 10901 Endry Street, Anaheim, Calif.

Filed Oct. 1, 1970, Ser. No. 77,179
Int. Cl. B62d *61/10*
U.S. Cl. 180—24.12 **1 Claim**



A mechanism mounted under a three axle type of truck and which includes one power or drive axle and a tag or dead axle tailing, the device comprising a vertically adjustable rollers which can be moved into a position so as to peripherally engage the tires on the power shaft and also the tires on the tag axle so as to transmit power to the wheels of the tag axle, the vertically adjustable rollers being vertically moveable by means of ram cylinders which are controlled from the dashboard of the vehicle.

3,724,582

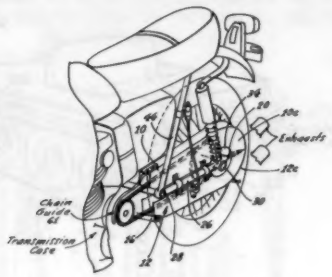
MOTORCYCLE CHAIN GUARD

George R. Wood, 528½ East Fairview, Inglewood, Calif.

Filed Oct. 18, 1971, Ser. No. 190,252
Int. Cl. B62j *13/04*
U.S. Cl. 180—33 R **3 Claims**

An oil splash cover for a motorcycle which comprises an elongated U-shaped upper housing section and a similarly configured inverted lower housing section spaced from each other along most of their lengths by brackets, and brought together and bolted at their trailing ends. The forward ends of the thus-held housing sections rest upon motorcycle frame members and the brackets securing the upper and lower housing sections in their spaced relationship are looped and fitted around a swinging arm for the cycle's rear wheel to support the housing in relation to said arm. A chain guide is mounted at a forward position to guide a broken end of the chain around a front sprocket. The two housing sections are configured along their edges adjacent the rear wheel axle to pro-

vide a larger opening. The lower housing section is further orificed to receive the end of an oiler tube and to locate said end above the lower portion of the chain loop to drip oil on the chain. The tube extends upwardly to an oil reservoir disposed

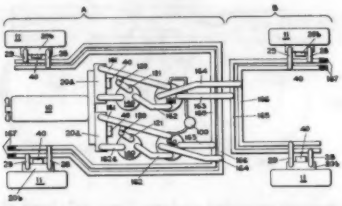


below the motorcycle seat or on top chain cover, the reservoir being provided with a manual valve means to regulate the oil drips through the tube and onto the chain. An oil drip drain is also provided at the trailing end of the rear section.

3,724,583
HYDRAULIC MOTOR AND PUMP SYSTEM

Alan K. Caldwell, Grand Rapids, Mich., assignor to Rewop Company, Kent County, Mich.

Filed Dec. 28, 1970, Ser. No. 101,447
Int. Cl. B60k *17/10*
U.S. Cl. 180—66 R **14 Claims**



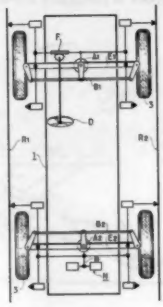
The specification disclosed a hydraulic system for driving automobiles in which a separate fluid flow system is provided for the front and rear wheels respectively. Each of the drives for the front wheels and for the rear wheels includes three variable displacement pumps, one for pumping fluid and the other two each acting as a motor for one wheel. Both fluid driving pumps are driven by an internal-combustion engine. The hydraulic pumps and hydraulic motors all have counterbalanced vanes which minimize friction. A ratio control valve for each pump and each motor controls the torque to speed ratio at the vehicle wheels. A pressure equalizing valve equalizes pressure between the front and rear fluid flow systems. A bypass valve automatically short-circuits the flow of fluid through a flow system when the vehicle's engine is idling.

3,724,584
VEHICLE GUIDANCE SYSTEM

Claude Varichon, Lyon, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed March 18, 1971, Ser. No. 125,676
Claims priority, application France, March 20, 1970, 7010171; Dec. 11, 1970, 7044828
Int. Cl. B62d *1/26*
U.S. Cl. 180—79 **4 Claims**

Guidance systems including at least one detector mounted on a vehicle and a guide rail along the path to be travelled by the vehicle. Each detector is forced to remain in contact with the rail. A throw-off-center between the vehicle and the guide rail is sensed by the detectors which cause guiding wheels on

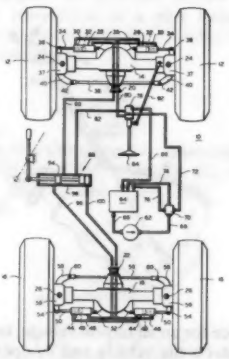


the vehicle to turn in a direction to reduce the throw-off center.

3,724,585
FLUID STEERING SYSTEM

Marcus L. Conrad, Stevensville, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation of Ser. No. 516,249, Dec. 27, 1965, abandoned. This application April 15, 1971, Ser. No. 134,164
Int. Cl. B62d *5/06*
U.S. Cl. 180—79.2 C **5 Claims**



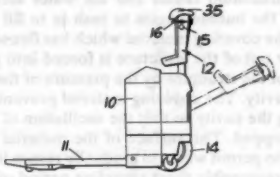
A steering system for achieving three different steering modes, having double acting fluid actuating means for pivoting the front wheels, additional double acting fluid actuating means for pivoting the rear wheels and operative control means for admitting pressurized fluid to and discharging fluid from the fluid actuator means. Two wheel steering is achieved in the usual manner. For conventional four wheel steering, the two fluid actuator means are connected in circuit in a manner that movement of the operator's control means directs pressurized fluid into one of the fluid actuator means, the fluid discharged from the said one actuator means entering the other fluid actuator means and the fluid discharged from the other fluid actuator means returning to the said operator's control means. When four wheel crab steering is desired, the system is first operated in the same manner as for conventional four wheel steering to get one pair of wheels to a desired angle after which the fluid actuator means for such pair of wheels is bypassed and the wheels are held in the selected pivoted position after which the operator's control means is turned in the opposite direction to pivot the other pair of wheels through the straight-ahead position and on to a position in which the other pair of wheels is in an attitude approximately parallel to the said one pair of wheels.

3,724,586

PEDESTRIAN OPERATED INDUSTRIAL TRUCKS

Cecil Goodacre, Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, England

Filed May 5, 1971, Ser. No. 140,524
Int. Cl. B60k 27/08
U.S. Cl. 180—91 8 Claims



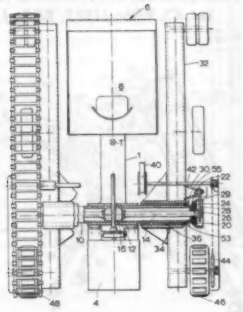
A pedestrian operated industrial truck has a reversible driving motor controlled by control means which are operated, through a connecting linkage, by a manually operable control member, the control member and linkage having a forward, neutral, and reverse conditions. There is mounted on a control handle of the truck an element which is displaceable relatively to the truck by engagement with an obstruction during forward movement of the truck. The manually operable control member is coupled with the connecting linkage by a releasable connection, and displacement of the displaceable element is arranged to release the connection and effect movement of the linkage, independently of the manually operable control member, from the forward to the reverse condition. Subsequent return of the displaceable element to its original position, upon reversal of the truck away from the obstruction, allows the linkage to return to the neutral condition, so stopping the truck, and the releasable connection is then automatically re-engageable only when the manually operable control member is also returned to the neutral condition.

3,724,587

SUSPENSION FOR PIVOTAL TRACK FRAMES ON TERRAIN MOTOR VEHICLES

Hans Kasin, and Odd Krane Thvedt, both of Notodden, Norway, assignors to Christiania Spigerverk, Division JOBU, Oslo, Norway

Filed April 5, 1971, Ser. No. 131,052
Int. Cl. B62d 55/10
U.S. Cl. 180—9.54 1 Claim



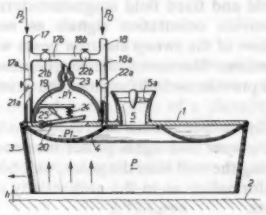
A suspension for pivotal track frames on terrain motor vehicles of the kind where the tractor body is supported by one single pivotal track frame on opposite sides of the body. The frames are provided with track wheels or belts. The new suspension comprises a journal bushing fixed to each of the pivotal frames and defining the pivot axis therefore. In the bushing are positioned thick-walled, solid tube-shaped elastic linings made of rubber or the like and which encompass a coaxially extending support beam mounted to the tractor body. The outside and the inside surfaces of the elastic linings are not rotatably joined to the inside of the bushing and the outside of the beam, respectively, such that the pivotal movements of the track frames when the tractor is moving through terrain take place under flexible deformation of the linings, which linings thus operate as spring suspensions and shock absorbers.

3,724,588

CUSHION CONFINING SYSTEM

Jean Henri Bertin, Neuilly-sur-Seine, and Paul Francois Gulenne, Paris, both of France, assignors to Bertin & Cie, Plaisir, France

Division of Ser. No. 775,697, Nov. 14, 1968, Pat. No. 3,587,773. This application Jan. 25, 1971, Ser. No. 109,200
Claims priority, application France, Nov. 17, 1967, 67128758
Int. Cl. B60v 1/16
U.S. Cl. 180—118 8 Claims



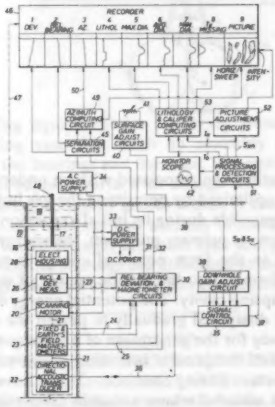
An air-cushion vehicle is provided with a deformable enclosure within the cushion. The enclosure is connected to two sources delivering different fluid pressures through control valves which allow the pressure in the enclosure to be adjusted to any value intermediate those of the above two sources.

3,724,589

WELL LOGGING METHODS AND APPARATUS

Joseph E. Chapman, III, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 26, 1969, Ser. No. 827,799
Int. Cl. G01v 1/22
U.S. Cl. 181—.5 BI 45 Claims



In accordance with an illustrative embodiment of the present invention, a well tool having a rotating transducer means is moved through a well bore. The transducer means is repetitively energized to emit acoustic energy into the media

surrounding the well tool, which energy is reflected off various circumferential portions of the well bore wall and returned to the rotating transducer means. An electrical signal pulse is developed in response to each burst of reflected energy received by the transducer means and this pulse, along with an electrical sync pulse representative of the time at which the transducer is energized, are transmitted to the surface of the earth via a receiver or signal pulse channel in the well tool. The signal gain in the receiver channel can be adjusted as desired, from the surface of the earth by sending a digital coded signal to the well tool from the earth's surface.

At the earth's surface, the sync and signal pulses are first normalized by a circuit which operates to maintain the peak sync pulse amplitude, on the average, substantially equal to a selected reference amplitude. The normalized signal pulses, after processing by suitable picture adjustment circuits, are utilized to modulate the intensity of an oscilloscope electron beam being swept across a record medium in synchronism with the rotation of the transducer means. The picture adjustment circuits include contrast and brightness control circuits. A monitor oscilloscope is also provided for visually displaying the sync and signal pulses.

Earth's field and fixed field magnetometers located in the well tool provide orientation signals as well as enabling synchronization of the sweep electron beam with the rotating transducer means. Moreover, the magnetometer signals are combined to provide an indication of the azimuth of the well tool.

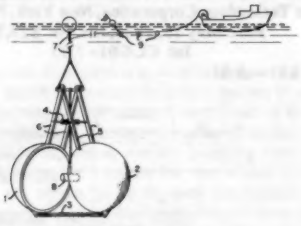
Additionally, caliper circuits are responsive to the time relationship of the sync and signal pulses for providing information concerning the well bore diameter, well bore eccentricity, as well as information as to the authenticity of these caliper measurements.

3,724,590

BUBBLE PULSE SUPPRESSION WITH ACOUSTIC SOURCE OPTIMIZATION

William C. Knudsen, 18475 Twin Creeks Road, Nomte Sereno, Calif.

Filed May 10, 1971, Ser. No. 141,849
Int. Cl. G01v *1/10, 1/28*
U.S. Cl. 181—.5 XC **12 Claims**



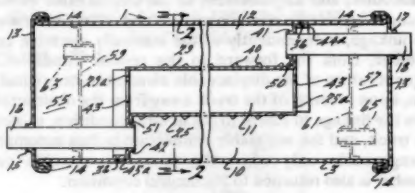
The acoustic wave associated with an underwater gas bubble pulse is optimized by permitting the gas bubble to expand as freely as possible during its initial expansion. After the initial expansion, or primary pulsation, the energy of the oscillatory system in the form potential energy is prevented from being transformed into the kinetic energy of water rushing in to fill a collapsing cavity. The potential energy of the oscillatory system is dissipated gradually to permit the device used to be made ready for the generation of a subsequent gas bubble. The method of the present invention is embodied, for example, in a structure having a surface which is covered with strips of a flexible material whose acoustic properties are close to the acoustic properties of water, e.g. a material for which rho-c, the product of the density of the material times the speed at which sound travels in the material, is close to the rho-c of water. The material is attached to the structure at selected points on the surface thereof. When a gas bubble is generated as a result of the creation of an acoustic wave, the acoustic wave is transmitted through the material and into the surrounding water without significant reflection or alteration. As the bubble expands, the water forced ahead of the expanding bubble is allowed to flow through the structure by the flexing of the covering material at the locations at which the material is not attached to the mesh structure. When the gas bubble has reached its maximum radius and the water surrounding the perimeter of the bubble begins to rush in to fill the cavity of the bubble, the covering material which has flexed to allow the water to flow out of the structure is forced into place around the exterior of the structure by the pressure of the water filling the bubble cavity. The covering material prevents water from rapidly filling the cavity so that the oscillation of the bubble is essentially stopped. The surface of the material may contain perforations to permit water to gradually return into the cavity to provide a reasonably short recycling period of the acoustic wave generation device.

3,724,591

FOLDED SHELL MUFFLER

Wladyslaw F. Malkiewicz, Casa Grande, Ariz., assignor to Tenneco Inc., Racine, Wis.

Filed March 26, 1971, Ser. No. 128,320
Int. Cl. F01n *1/00*
U.S. Cl. 181—53 **6 Claims**



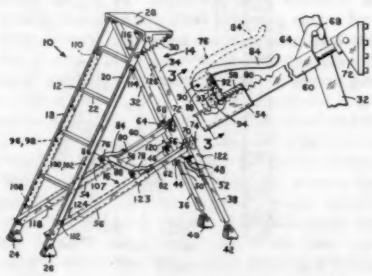
A gas silencing muffler has an external shell and inner gas passages formed from a single piece of sheet metal that is bent, folded, and welded to form a pair of exterior walls that define the shell and a pair of internal walls that define the gas passages.

3,724,592

ADJUSTABLE LADDER AND SCAFFOLD

Henry Fleischer, 18 Notch Park Road, Little Falls, N.J.

Filed June 29, 1971, Ser. No. 157,866
Int. Cl. E06c *1/383*; E04g *1/30*
U.S. Cl. 182—27 **5 Claims**



A ladder having one or more of its legs individually extensible so as to enable it to stand or be supported on an irregular surface. The ladder can be converted into a scaffold whose height may be varied utilizing the extensible legs. A standard ladder can be converted for use on irregular terrain by the addition of a novel single leg supported by the lower rung of the ladder and movable therealong.

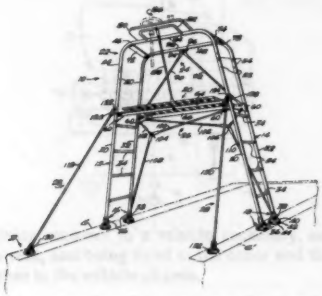
3,724,593
ROPE CLIMBING DEVICE
Dennis G. O'Keefe, 20450 Acre St., Canoga Park, Calif.
Filed May 10, 1971, Ser. No. 141,488
Int. Cl. A63b *27/00*
U.S. Cl. 182—134 8 Claims

A rope climbing device comprising a frame member adapted to be attached to a climber's legs, rope-griping means connected to said frame member to engage said frame to said rope in a locking relationship, toe operable means to engage or disengage said rope-gripping means from said rope to enable said climber to ascend or descend the rope.

3,724,594
SYSTEM FACILITATING OPERATIONS TO BE CARRIED OUT ON A SHIP
Carldavid Jonsson, Kinstad, Sweden, assignor to Svenska Alucrom AB, Linkoping, Sweden
Filed April 5, 1971, Ser. No. 131,042
Claims priority, application Sweden, June 16, 1970, 8310/70
Int. Cl. E04g *3/14*
U.S. Cl. 182—36 4 Claims

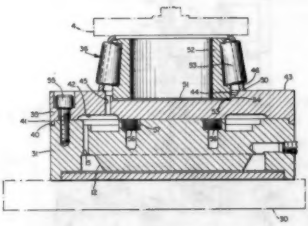
To permit carrying out work on a ship's hull, such as sand cleaning, painting etc. under unfavorable weather conditions it has been necessary hitherto, — if work could be performed at all — to provide for temporary weather protection by way of tarpaulins and like means. The system herein described which permits such operations to be carried out on ship's hulls independently of weather conditions, comprises roof elements, wall elements and end wall elements so mounted as to form heatable premises separated from ambient air.

3,724,595
TUNA TOWER
Jeffrey S. Green, 16810 N.E. 4th Court, North Miami Beach, Fla.
Filed April 14, 1972, Ser. No. 244,111
Int. Cl. E06c *5/02, 7/18*
U.S. Cl. 182—118 10 Claims



An adjustable, prefabricated tuna tower for installation on boats used for sport fishing. The tuna tower of the present invention is provided in the form of a plurality of sub-assemblies, braces and struts which are sold in a carton package and which may be assembled and installed on any one of a plurality of types of boats having variable beam measurements.

3,724,596
BEARING LUBRICATOR
John F. Freda, 504 Division Avenue, Willow Grove, Pa.
Continuation of Ser. No. 798,354, Feb. 11, 1969, abandoned.
This application July 22, 1971, Ser. No. 165,293
Int. Cl. F16n *7/14, 11/10*
U.S. Cl. 184—1 D 14 Claims

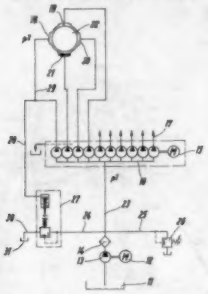


Lubricating equipment for supplying grease to a tapered roller bearing assembly, such an assembly comprising the inner race, the bearings and the cage. The equipment includes a horizontal support surface to engage the cage, an annular groove forming a ring of grease which is caused to rise upwardly into the bearings and a cavity inboard of the groove, the wall of which engages the inner race and positions the assembly so that the bearings are presented to the groove so that the ring of grease rises up inbetween and around the bearings.

3,724,597
DEVICE FOR THE HYDROSTATIC SUPPORTING OF MACHINE PARTS
Arnold E. E. Bereit, Holbeinstrasse 68, Berlin, Germany
Filed Nov. 19, 1971, Ser. No. 200,309
Int. Cl. F16c *1/24*
U.S. Cl. 184—5 8 Claims

A device or system for hydrostatically supporting machine parts wherein the pressure fluid is conducted to several points

from a supply pressure pump through a multi-circuit distributor pump. A differential pressure valve is connected to the output of the supply pump and to at least one of the circuits from the distributor pump. The differential pressure valve has



a first valve member to control flow from the supply pump to an overflow in a first pressure range and in a second pressure range by a second valve member, the second valve member having a spring means which determines the differential pressure.

3,724,598

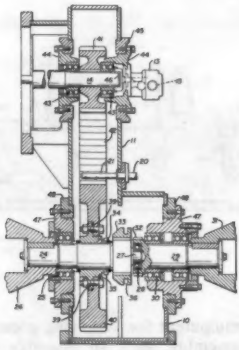
POWER TRANSMISSION WITH LUBRICATING MEANS

Edson W. Smith, Elmira, N.Y., assignor to American LaFrance Inc., Willoughby, Ohio

Filed Aug. 25, 1971, Ser. No. 174,780

Int. Cl. F01m *1/12*

U.S. Cl. 184—6.1 **5 Claims**



A power transmission with lubricating means is adapted for alternately driving a wheeled vehicle and a pump mounted thereon and varies the quantity and application of the lubricant in the transmission to provide desirable quantity and application of the lubricant for each of the alternate operations.

3,724,599

ENGINE OIL PAN

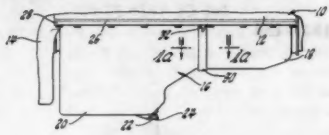
Walter C. Heidacker, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1971, Ser. No. 202,088

Int. Cl. F16n *31/00*

U.S. Cl. 184—6.5 **6 Claims**

An engine oil pan is provided with a tear strip to separate the pan into two portions for ease of removal of the pan when its engine is installed in a vehicle. A flexible plastic liner is used upon reinstallation of the separated portions of the pan



to provide an oil containing structure. The liner may also act as a gasket and may include a thickened portion to fill the gap caused by removal of the tear strip.

3,724,600

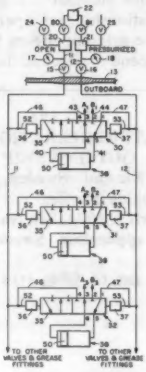
SUBMARINE OUTBOARD GREASING SYSTEM

Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 29, 1971, Ser. No. 167,394

Int. Cl. F16n *7/10*

U.S. Cl. 184—7 D **2 Claims**



A greasing system comprised of two major grease supply lines and a series of individual floating valve and piston units connected in parallel, between the supply lines, is provided. Two supply lines penetrate the ship's hull, with both a grease source and a pressurizing means located inside the ship. The system is arranged so that when one supply line is pressurized, the other is open to permit discharge of excess grease. Individual grease fittings are connected in pairs to each floating valve and piston unit. The floating valve alternately opens passages to opposite sides of the floating piston and each floating piston forces a measured amount of grease to alternate fittings through other passages in the floating valve.

3,724,601

METHOD OF LUBRICATING PNEUMATIC MACHINES AND APPARATUS THEREFOR

Edgar P. Scragg, 60 Mulder St., Florida Park Ext. 3, Transvaal Province, Republic of South Africa

Filed June 16, 1970, Ser. No. 46,654

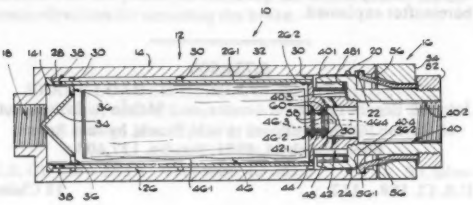
Claims priority, application South Africa, June 23, 1969, 69/4457

Int. Cl. F16n *7/30*

U.S. Cl. 184—56 A **21 Claims**

A device and method are disclosed for dosing a flowing stream of fluid. The prime field of utility of the invention is the

lubrication of pneumatic machines but it is not restricted to this. In its disclosed lubricator form the device includes a casing which is connected into a fluid (generally air) stream with a lubricant container in the casing. The container includes a



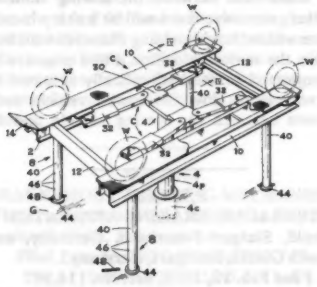
bag of flexible material and the fluid stream is caused to impinge on the bag so as to flatten it and expel the lubricant through the nozzle into the stream. The air can be filtered while passing through the casing but prior to it being dosed.

3,724,602

AUTOMOBILE HOIST

Jack Frank Hernick, 6 Carousel Court, Toronto, Ontario, Canada

Filed Feb. 22, 1971, Ser. No. 117,268
Int. Cl. B60s *9/22*
U.S. Cl. 187—8.54 **11 Claims**



A vehicle hoist equipped with runways onto which a car may be driven to be hoisted, and linkage for releasably coupling said runways to the elevating piston of the hoist so as to be lifted thereby; the runways being thereafter temporarily supportable on telescopable props while the piston is de-coupled and lowered to render the vehicle bottom wholly accessible for repairs or analogous services.

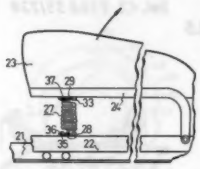
3,724,603

COLLISION FORCE ABSORPTION DEVICE

Masanao Shiomi, Toyota, and Tadataka Narumi, Kariya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Division of Ser. No. 884,675, Dec. 12, 1969. This application July 13, 1971, Ser. No. 162,202
Int. Cl. F16d *63/00*
U.S. Cl. 188—1 C **2 Claims**

An energy absorbing member in the shape of an elongated bar folded in its central portion to provide a plurality of closely spaced laminations each substantially perpendicular to the longitudinal axis of the bar, being capable of plastic deformation in one direction only, and being rigid in the opposite direction, said energy member being fixed at one end through



a force receiving member to a vehicle accessory, such as a bumper, or a seat, and being fixed at the other end through a support member to the vehicle chassis.

3,724,604

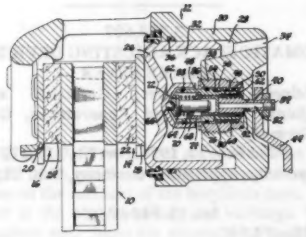
Patent Not Issued For This Number

3,724,605

DISC BRAKE WITH INTEGRAL PARKING BRAKE

Thomas D. Naismith, Dayton, and Ronald L. Shellhause, Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1971, Ser. No. 195,285
Int. Cl. F16d *65/54*
U.S. Cl. 188—71.8 **5 Claims**



A disc brake caliper assembly includes a hydraulically actuated first piston, a second piston engagable with the first piston, a mechanical actuating mechanism which moves axially into the housing when actuated, and an extendable member acting between the adjuster piston and the mechanical actuating mechanism and including an apertured locking plate closely surrounding a shaft to form a one-way clutch. The extendable member provides a rigid force transmitting linkage between the mechanical actuating mechanism and the pistons for mechanical actuation of the brake. An adjuster spring increases the length of the extendable member to move the adjuster piston into closer relationship with the disc to adjust for lining wear.

3,724,606

DISK BRAKE ASSEMBLY

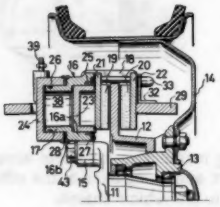
Toyoaki Kobayashi, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed March 29, 1971, Ser. No. 128,844

Claims priority, application Japan, March 30, 1970, 45/26783

Int. Cl. F16d *55/228*

U.S. Cl. 188—72.5 3 Claims



This invention relates to improvements in and relating to a disc brake assembly of the spot-acting type, especially for use with a powered vehicle such as automotive vehicle. More specifically, the invention relates to such a type of automotive brake unit, wherein a stationary brake cylinder having a pair of opposedly acting hydraulic pistons is positioned at one side of a rotatable brake disc and a movable plate is arranged as straddling said plate in a direction parallel to the axis of said disc when actuated upon by an indirectly acting type one of said pistons, while the other directly acting type piston is also being actuated.

The improvement resides in such that said movable plate is mounted at its one end by at least two support lugs formed diametrally opposite to each other on said indirectly acting piston and suspendedly mounted from U-shaped guide pins mounted in turn on a body member of said brake unit, for load distribution and the like purposes.

3,724,607

AUTOMATIC SLACK ADJUSTING DEVICE FOR A BRAKE LEVER

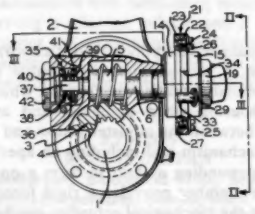
Erich Reinecke, Hannover, Germany, assignor to Westinghouse Bremsen-Und Apparatebau, GmbH, Hannover, Germany

Filed Feb. 22, 1971, Ser. No. 117,372

Claims priority, application Germany, Feb. 21, 1970, P 20 08 139.4

Int. Cl. F16d *65/56*

U.S. Cl. 188—79.5 K 6 Claims



This invention relates to an automatic slack adjuster arrangement for the brake lever of the brake cam shaft of the brake, especially for street vehicles, with the worm wheel arranged on the brake cam shaft and in engagement with the worm that is positioned on the worm shaft that is rotatably mounted in the brake lever which, as soon as wear of the brake shoe occurs, rocks through an angle that exceeds the permissible value. This additional rocking of the brake lever adjusts the position of the brake lever in the manner hereinafter explained.

3,724,608

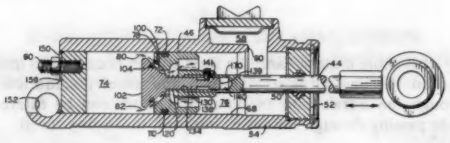
DRAFT DEVICE

John M. Beach, 116 Davis Avenue, and Melvin A. Brown, both of Dayton, Ohio, assignors to said Beach, by said Brown

Filed March 24, 1971, Ser. No. 127,603

Int. Cl. B60t *7/20*

U.S. Cl. 188—112 11 Claims



Between a towing vehicle and a towed vehicle is a draft device made up of a draw bar attached to the towing vehicle and a telescoping draw bar attached to the towed vehicle with a lost motion connection between the draw bars. A cylinder is mounted on the one draw bar and a piston-piston rod is attached to the other draw bar with the piston located in the cylinder to provide two variable volume chambers which exhaust fluid from one chamber to the other during relative movement of the draw bars. A metering orifice is formed in the piston and a valve controls the metering orifice so that if the closing movement between the towing vehicle and the towed vehicle is excessive there will be a sharp increase in the fluid pressure within the exhausting chamber which causes the valve to close the metering orifice. Fluid pressure buildup is then communicated to the hydraulically actuated brakes on the towed vehicle to slow the towed vehicle and prevent further closure between the towing vehicle and the towed vehicle.

3,724,609

HYDRAULIC BRAKING APPARATUS

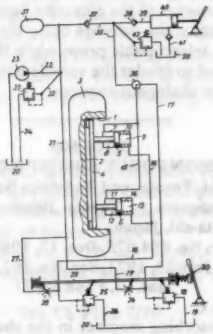
Walter Kobald, Stutgart-Feuerbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 12, 1971, Ser. No. 114,907

Claims priority, application Germany, Feb. 21, 1970, P 20 08 052.8

Int. Cl. B60t *13/14*

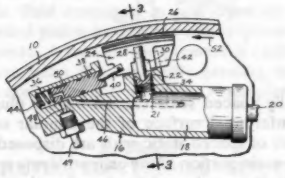
U.S. Cl. 188—170 9 Claims



A hydraulic brake is operated by a piston located in a brake cylinder. Pressure fluid from a pump is supplied through two

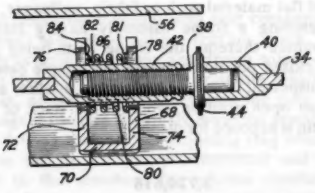
conduits to two chambers formed by the piston in the brake cylinder, and each conduit has an adjustable pressure limiting valve and a variable throttle operated simultaneously by a linkage connected with the brake pedal so that the pressures in the cylinder chambers are varied. The force resulting from the pressure differential between the chambers acts in one direction on the piston for releasing the brake, and in the opposite direction for actuating the brake.

3,724,610
BRAKE LOAD SENSING AND CONTROL DEVICE
Jose G. Caero, 4205 Clayton Road West, Ft. Worth, Tex.
Filed Jan. 29, 1971, Ser. No. 111,044
Int. Cl. B60t 8/06
U.S. Cl. 188—181 T 9 Claims



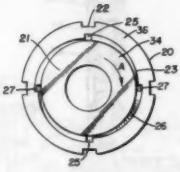
A brake device responsive to changes in the coefficient of friction between a wheel of a moving vehicle and the road over which the vehicle is passing. The brake device includes a shiftable friction member engageable with part of the rotating wheel. The friction member is operatively connected into the brake actuating system for the vehicle and is constructed so as to experience a movement while the coefficient of friction between the wheel and the road is experiencing a change from the dynamic to static, such as when the wheel becomes locked and the vehicle goes into a skid. This movement of the friction member causes a reaction in the brake actuating system permitting the wheel to road coefficient of friction to return to its dynamic status.

3,724,611
BRAKE SHOE CENTERING MECHANISM
John L. Winge, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.
Filed June 16, 1971, Ser. No. 153,717
Int. Cl. F16d 65/16
U.S. Cl. 188—216 6 Claims



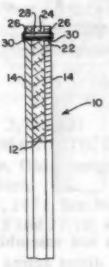
A brake in which friction between a rotating drum and a primary brake shoe produces a force which acts on a secondary brake shoe to move the latter shoe into engagement with the drum to thereby decelerate the drum. A shoe retracting device is mounted on the brake backing plate for operative engagement with a strut which interconnects a pair of adjacent ends of the primary and secondary shoes so that the secondary shoe is withdrawn from engagement with the drum upon brake release.

3,724,612
REFURBISHABLE BRAKE DISC
Raymond G. Spain, 4805 Metcalf Drive, Raleigh, N.C.
Filed March 1, 1971, Ser. No. 119,773
Int. Cl. F16d 65/12
U.S. Cl. 188—218 XL 6 Claims



A brake disc is provided with a recess in the region which normally frictionally contacts an adjacent disc. A removable insert complementary to said recess is placed therein, rotated, and locked against further rotational movement within the recess. Inserts worn due to use may be replaced with new inserts.

3,724,613
BRAKE DISC WITH BERYLLIUM CORE AND CARBON WEAR FACES
Peter D. Bermingham, Suffield, Ohio, assignor to The Goodyear Tire and Rubber Company, Akron, Ohio
Filed Oct. 16, 1970, Ser. No. 81,208
Int. Cl. F16d 65/12
U.S. Cl. 188—218 XL 5 Claims

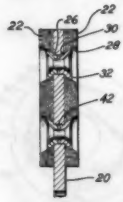


The rotating and stationary discs of a disc brake assembly are each formed of an annular beryllium core and annular carbon wear faces on the surfaces of the beryllium core. The wear faces are held to the core by rivets and bushings. The drive slots in the carbon wear faces are aligned with and match the drive slots of the beryllium core.

3,724,614
COMPRESSION FASTENER
John R. Bender, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.
Filed June 9, 1971, Ser. No. 151,451
Int. Cl. F16b 19/06; F16d 13/62, 65/10
U.S. Cl. 188—218 XL 7 Claims

Fastening means including a circular insert adapted to fit into a mating opening of a segment of brittle material and fixedly secure same to a relatively stiff backing member. The insert has a sleeve portion and integral head and shoulder portions. The head portion is funnel shaped with its inner included angle greater than its outer included angle. A plurality of radially extending slots in the head portion permit radially outward flexing thereof. The outer included angle of the head portion is greater than the included angle of the mating open-

ing and contact therebetween is established substantially simultaneously with engagement of the shoulder portion with the backing member. A rivet or similar fastening member extending through the insert exerts an axially directed force



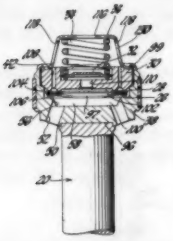
thereon causing the head portion to flex thereby progressively increasing the contact area between the head portion and adjacent wall of the mating opening to draw the segment into contact with the backing member with a minimum of bending force.

3,724,615

SHOCK ABSORBER WITH WELDED PISTON

Joseph R. Stormer, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1971, Ser. No. 115,222
Int. Cl. F16f 9/348
U.S. Cl. 188—322 **2 Claims**



A piston and piston rod assembly for use in a hydraulic shock absorber of the direct acting type has an open ended piston with a base having a flat weld surface thereon fixedly secured to the end of a piston rod. Rebound and compression valving are secured in the open end of the piston and flow passageways are formed in the base of the piston in close noninterference relationship with the weld surface on the piston base. The piston and piston rod are connected by an improved method which maintains flow paths in the connected parts.

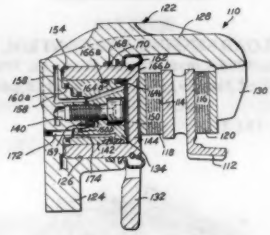
3,724,616

TANDEM CYLINDER DISC BRAKE

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed April 22, 1971, Ser. No. 136,470
Int. Cl. B60t 11/20
U.S. Cl. 188—345 **2 Claims**

A tandem cylinder caliper disc brake is disclosed which includes a two-piece caliper housing. The main portion of the caliper includes a housing which defines the usual bore therewithin in which the actuating piston of the brake is adapted to reciprocate. The second portion of the caliper is a plug which is secured to the main portion by suitable fastening means and which cooperate with the wall of the bore to define an annular chamber therebetween. The actuating piston includes an annular section and a transversely extending section which closes one end of the annular section. The annular section is slidably received within the annular chamber defined between the plug and the walls of the bore. A first chamber defined between the end of the annular section and the corresponding end of the bore is communicated to a first vehicle hydraulic system, and a second chamber defined between the transversely extending portion of the piston and the end of the plug is communicated to a second vehicle hydraulic system. A



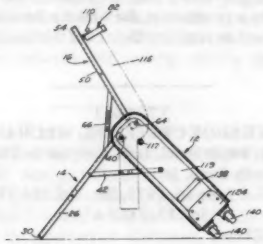
pair of axially spaced seals carried by the plug engage the inner circumferential surface of the annular section of the piston. A pair of spaced static seals are disposed between the plug and the main portion of the caliper. Vents are provided to communicate the portion of the interface between the plug and the piston between the two dynamic seals and the portion of the interface between the plug and the main portion of the caliper between the two static seals to the exterior of the caliper.

3,724,617

PORTABLE SAMPLE CASE

Gerald J. Lawler, 71 North Park Street, Franklin, Mass.

Filed Jan. 11, 1971, Ser. No. 105,375
Int. Cl. A45c 3/00
U.S. Cl. 190—16 **7 Claims**



A portable sample case for use in transporting and displaying a stack of flat material such as fabric, wallpaper, rugs and the like, including a frame assembly having frame units pivotally mounted thereon, the frame units being normally located in a closed position wherein the sample case in conveniently transported from one location to another and being movable to an open position, wherein the stack of material located therein is exposed for display.

3,724,618

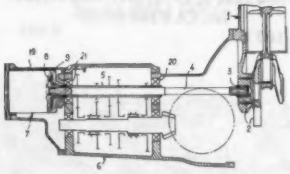
TRANSMISSION MECHANISMS WITH HYDROSTATIC COUPLING

Francois C. Pruvot, and Jean-Claude Carre, both of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of France

Filed May 10, 1971, Ser. No. 141,631
Int. Cl. F16d 31/02
U.S. Cl. 192—.07 **15 Claims**

This mechanism for transmitting a torque to a hydrostatic coupling of the barrel-cylinder type is characterized in that

each piston of the barrel-type cylinder block is hollow and incorporates a delivery valve and that its cylinder is supplied with pressure fluid through a non-return valve; furthermore, the inner cavity of each piston is constantly connected to a chamber formed in the cylinder block and centered to the axis



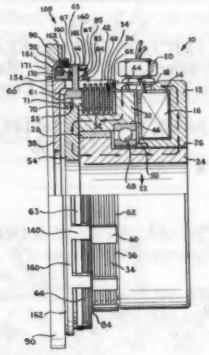
of rotation of this block. A valve member is movable under the control of the fluid contained in said chamber against the force of a central piston having one side responsive to an adjustment pressure. A forced-feed pressure is exerted through said non-return valve for constantly pressing the cylinder-block pistons against the corresponding swash plate.

3,724,619

SELF-ADJUSTING ELECTROMAGNETIC CLUTCH-BRAKE

Donald L. Miller, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed March 31, 1971, Ser. No. 129,744
Int. Cl. F16d *13/22*
U.S. Cl. 192—18 B **11 Claims**



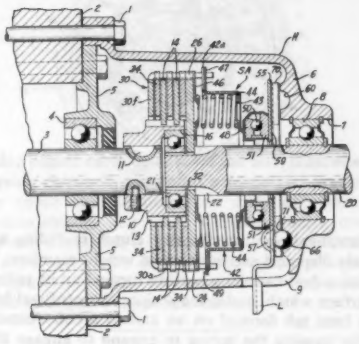
An electromagnetic clutch with rear compensating means having two sets of coacting friction discs adapted for releasably coupling a driving and driven rotary complement. When the clutch is energized, the armature, which is not in the drive train, contactively engages with the pole faces of the electromagnet causing the freely mounted armature to rotate with the driving member; an adjusting ring which is slidably splined to the driven rotary component and advanceably threaded to the armature for relative rotation therewith, thereby applies the necessary engagement pressure to the friction disc assembly causing torque to be transmitted from the driving to the driven rotary component through the disc assembly. Any lost motion occasioned by wear of the friction disc is automatically compensated by the screw-action of the adjusting ring upon the armature. When the clutch is de-energized, a resiliently biased braking member which is slidably splined to the clutch adjusting ring is caused to bear against a stationary braking body to achieve braking. The brake member is advanceably threaded to a brake adjusting ring to automatically compensate for wear of the braking surfaces.

3,724,620

RELEASEABLE POWER TRANSMITTING DEVICE OF THE FRICTION PLATE TYPE

Carl I. Benson, Jr., Westwood, Mass., assignor to Paragon Gears Incorporated, Taunton, Mass.

Filed Oct. 12, 1971, Ser. No. 188,201
Int. Cl. F16d *13/56*
U.S. Cl. 192—70.23 **11 Claims**



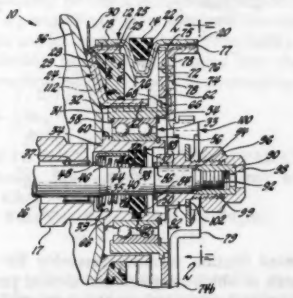
A power-transmitting device including releaseable, interleaved friction plates between an input member and an output member, and which device is normally engaged and is releaseable by a camming action between certain of the parts. A spring pack assembly acts to maintain the interleaved friction plates in clamped-up position and the arrangement is such that the spring assembly compensates for wear of the plates and other parts and also provides a constant torque capacity for the device.

3,724,621

ELECTROMAGNETIC CLUTCH

John H. Heldorn, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1971, Ser. No. 212,715
Int. Cl. F16d *27/10, 43/14*
U.S. Cl. 192—84 C **5 Claims**

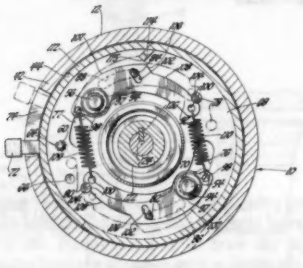


The clutch illustrated includes electromagnetic engagement means having an integral centrifugal action arrangement for supplementing the magnetic engagement when the coil is energized and serving as the resilient means for retracting the armature plate when the coil is deenergized.

3,724,622
SPRING CLUTCH

Daniel J. Barbulesco, and John R. Briar, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed April 19, 1971, Ser. No. 135,084
Int. Cl. F16d *43/24*
U.S. Cl. 192—105 CE 6 Claims

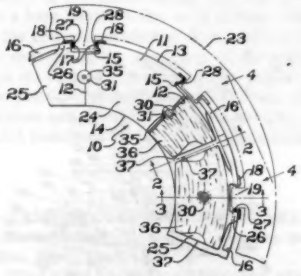


A centrifugally-actuated spring clutch including a pair of oppositely disposed arcuate-shaped weight members, each of which has a first camming portion formed on its radially outward surface which, under the action of centrifugal force, engages a bent tab formed on an end of a coil-wound torque spring for causing the spring to expand to engage the inner peripheral surface of a drive member and thus be driven thereby, the torque spring, in turn, being connected via a connector plate to drive an output shaft. Manually rotatable pin means are included for engaging a second camming surface formed adjacent the free end of each of the weight members to prevent their response to centrifugal force during the seasons of the year when the air compressor need not be operative.

3,724,623
SEGMENTED FRICTION MEMBER ASSEMBLY FOR BRAKE OR CLUTCH

Arthur J. Thrower, and Marvin E. Hotchkiss, both of Troy, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Sept. 30, 1971, Ser. No. 185,238
Int. Cl. F16d *65/12*, *13/64*
U.S. Cl. 192—107 R 17 Claims

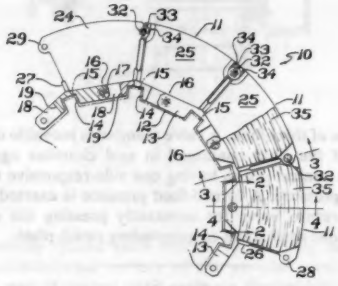


A segmented friction member assembly for a disc type brake or clutch in which straps extend around peripheral portions of segmental facing members and segmental heat absorbing bodies to hold the assembly together. The straps connect adjacent facing members in a manner such that there is a balanced reaction to forces exerted on said facing members. The straps also resist wear of the friction member and the torque keys in the area where the friction member is keyed to the rotating or nonrotating structure for transmitting torque thereto.

3,724,624
SEGMENTED FRICTION MEMBER FOR BRAKE OR CLUTCH

Walter J. Le Blanc, and Friedrich K. W. Rohrlack, both of Troy, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed June 2, 1971, Ser. No. 149,189
Int. Cl. F16d *69/00*
U.S. Cl. 192—107 R 10 Claims

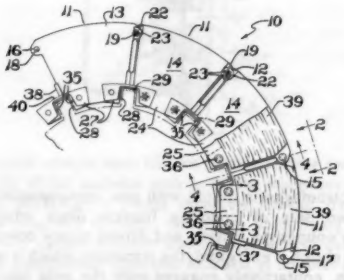


A brake or clutch mechanism having an annular stator or rotor with a plurality of individual segments connected at one periphery to a torque link ring having tongue and groove hinged connections at the ends of adjacent links for transmitting torque forces without tilting the segments. The connection to the torque link ring and the two connections to adjacent segments at the other periphery provide an improved mounting of each segment.

3,724,625
SEGMENTED FRICTION FOR BRAKE OR CLUTCH

Friedrich K. W. Rohrlack, and Ralph R. Main, both of Troy, Ohio, assignors to The G. F. Goodrich Company, New York, N.Y.

Filed June 2, 1971, Ser. No. 149,190
Int. Cl. F16d *69/100*
U.S. Cl. 192—107 R 6 Claims

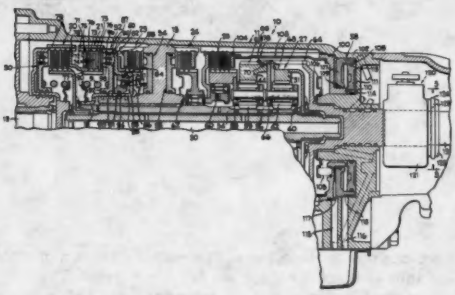


A brake or clutch mechanism having an annular stator or rotor with a plurality of individual segments. Each segment has a plate member of heat absorbing material held between facing members connected directly one to the other at radially outer corners through overlapping ears riveted together and to a spacer which fits in indentations at the outer corners of the plate member. At the inner periphery dovetail flanges of the facing members retain a radially extending tongue of the plate member and are connected at each side of the tongue to corresponding flanges on adjacent facing members by torque links with a beveled connection between the torque links and the dovetail flanges to resist twisting and turning of the facing members through a four-point mounting of each segment in the mechanism.

3,724,626
TRANSMISSION

Julius A. Clauss, Jr., Birmingham; Jack S. Conley, Milford, and Robert W. Lemon, Farmington, all of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 27, 1970, Ser. No. 67,326
Int. Cl. F16d *13/60*
U.S. Cl. 192—109 F 7 Claims

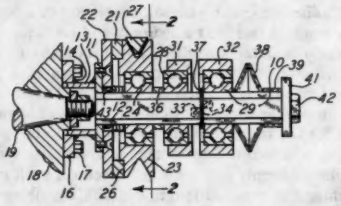


An automatic transmission providing variable speed ratio and reverse drives between drive and driven shafts and including friction-engaging devices, in the form of friction clutches and brakes, for establishing the drives. The devices are operable by hydraulic servomotors, certain servomotors each having first and second pistons arranged in tandem, with the first piston being movable by hydraulic fluid to engage the associated friction device, the second piston being movable by hydraulic fluid to also move the first piston during the application of hydraulic fluid to the first piston to thereby substantially double the effective area of the pistons of the servomotor to provide additional increased pressure to the engaged friction device. The transmission also includes an hydraulic governor fixed to the driven shaft by a locking spring clamp connector positively holding and keying the governor to the shaft in a simple assembly operation and in a manner to insure sealing between fluid-passage ports in the shaft and in the governor body for transfer of activating hydraulic fluid.

3,724,627
POWER-TAKE OFF CLUTCH

Keith H. Rhodes, Winneconne, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed March 1, 1972, Ser. No. 230,629
Int. Cl. F16d *13/22*
U.S. Cl. 192—110 B 3 Claims

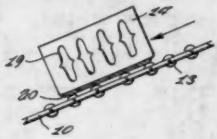


A power-take-off clutch having a shaft and a friction disc rotatable in unison and having a pulley piloted on the shaft to be axially moved into friction and therefore driving contact with the disc for the power-take-off. A series of ball bearings are on the shaft, including one for mounting the pulley, and other ball bearings are available for receiving an actuator which axially displaces the pulley for the drive engagement mentioned. The ball bearings have their inner races with hexagonally shaped bores which slide on the hexagonally shaped shaft, and thus the shaft and the inner races do not rotate relative to each other and they therefore do not wear out.

3,724,628
PLASTIC CARRYING CASE FOR USE WITH SKATEWHEEL CONVEYERS

Theodor M. Box, 1108 Aileen Road, Brielle, N.J.

Continuation of Ser. No. 807,302, March 14, 1969, abandoned. This application Feb. 16, 1971, Ser. No. 115,500
Int. Cl. B65g *13/00*
U.S. Cl. 193—35 R 5 Claims

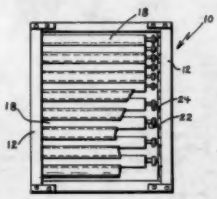


A molded plastic carrying case for use with skatewheel conveyors having outwardly projecting external ribs over substantially the entire base to define an array of geometrically shaped substantially identical recesses whose maximum crosssectional dimension is equal to a function of the distance between each axle of the skatewheel conveyor. The recesses can take various forms and the two preferred shapes disclosed are circular and square-shaped recesses.

3,724,629
ROLLER ASSEMBLY

William Collins, 1490 Dillingham Boulevard, Apt. No. 215, Honolulu, Hawaii

Filed Nov. 16, 1971, Ser. No. 199,100
Int. Cl. B65g *13/11*
U.S. Cl. 193—35 R 6 Claims



A roller assembly having a pair of frames pivotally joined together and a plurality of rollers mounted therein. A pair of roller supports are secured to each frame in such a manner as to permit individual rollers to be removed from the assembly without interrupting the operation of any remaining rollers.

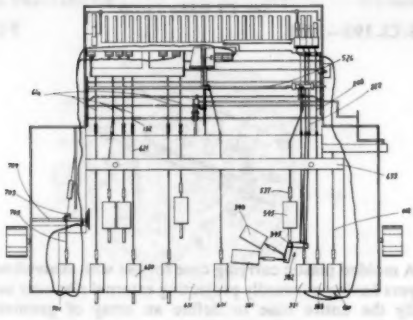
3,724,630
INPUT-OUTPUT TYPEWRITER APPARATUS

Edwin E. Manson, Harrisburg, Ohio, assignor to MI² Inc., Columbus, Ohio

Filed Oct. 8, 1970, Ser. No. 79,202
Int. Cl. B41j *5/30*
U.S. Cl. 197—19 1 Claim

A typewriter which is remotely operable or capable of providing signals for remotely operating another typewriter. The typewriter has movable mechanical mechanisms, such as interposers, for operating the character printing and carriage function mechanisms of the typewriter. A mounting board is horizontally mounted to the typewriter frame beneath the typewriter mechanism and a plurality of horizontally operable solenoids are mounted to the underside of the mounting board. The solenoids are connected to the interposers and other mechanical mechanisms by a plurality of connecting

rods which extend downwardly from the typewriter mechanisms and then horizontally beneath the mounting board to the plungers of the solenoids. Blade switches are provided which seat in cam follower relationship against a cam



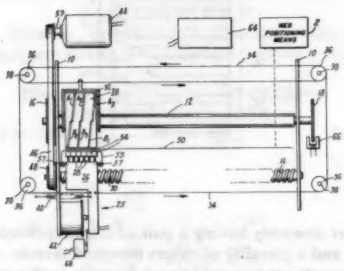
lobe portion of the interposers and other typewriter mechanisms for providing output data. Selected ones of the connecting rods are provided with clevises which may be snapped on the standard clevis pins of the interposers.

3,724,631

PRINTER WITH HELICALLY ARRANGED TYPE DIVIDED INTO AXIALLY OFFSET GROUP

Steven L. Kaczeus, Chelmsford, Mass., assignor to Printer Technology, Inc., Woburn, Mass.

Filed Jan. 15, 1971, Ser. No. 106,850
Int. Cl. B41j *1/22, 1/32*
U.S. Cl. 197—49 **11 Claims**



An electronic printer employs a character drum on which the elements are arranged along helical paths, and are divided into a plurality of discrete, axially offset character groups. An impact member is aligned with each of the character groups, and enables printing during concurrent rotation of the drum and axial movement of both the drum and the hammers synchronously past the object to be printed.

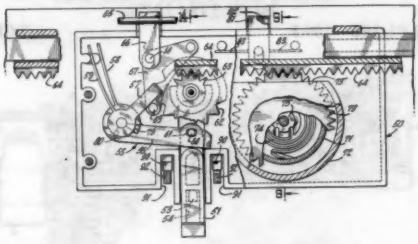
3,724,632

TYPEWRITER

Shigeaki Kuramochi, Tokyo, Japan, assignor to Louis Marx & Co., Inc., New York, N.Y.

Filed May 10, 1971, Ser. No. 141,861
Int. Cl. B41j *1/32*
U.S. Cl. 197—85 **8 Claims**

The operating characteristics of an inexpensive typewriter intended primarily for juvenile use are improved with respect to the ribbon drive and reversal of ribbon drive direction and with respect to the carriage escapement. A single lever positions two cams so that one reel is driven by key action and draws in ribbon while the other is free-running and feeds out ribbon. Shifting the lever, positions the cams to shift the drive



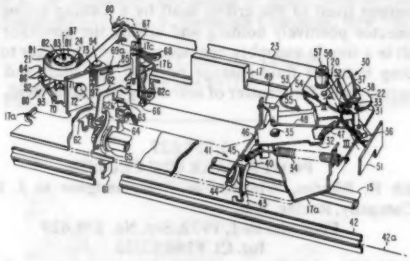
from one reel to the other with reversed direction of rotation and thus changes the direction of ribbon travel. The carriage escapement is contained in a single cartridge and is driven by both key action and space bar action. The cartridge also provides a mount for a ribbon-vibrator.

3,724,633

FEED SYSTEM FOR AN ADHESIVE RIBBON OR THE LIKE

Frank J. Korb, and John O. Schaefer, both of Lexington, Ky., assignors to International Business Machines corporation, Armonk, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,695
Int. Cl. B41j *33/14*
U.S. Cl. 197—151 **13 Claims**



An adhesive erasing ribbon employed in a typewriter is reliably tracked and fed by a supply and takeup mechanism that positively maintains resilient tension on the ribbon. A spring device acting against a cam in the form of a multi-toothed ratchet, positively maintains continuous tension on the ribbon regardless of any tendency caused by vibrations and continued stress for the ribbon to loosen during extended periods of non-feeding operation. The tension maintaining mechanism and the ribbon supply spool are mounted on a tilting platform to minimize the exposed length of adhesive ribbon and thereby minimize its deterioration.

3,724,634

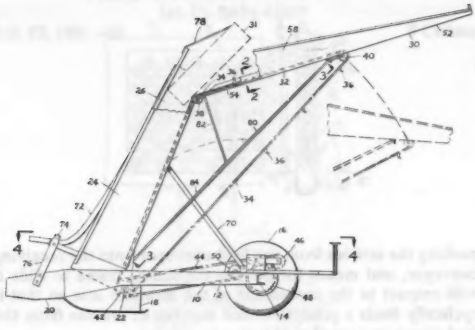
BALED HAY LOADING MACHINE

Richard B. Miskin, Ucon, Idaho
Division of Ser. No. 769,767, July 31, 1968, Pat. No. 3,667,779. This application Aug. 28, 1970, Ser. No. 67,771

Int. Cl. B65b *65/02*
U.S. Cl. 198—7 BL **4 Claims**

The present invention relates to a hay loading machine with an upper platform that extends rearwardly and with drive

means for loading bales of hay and the like upwardly and then rearwardly along the rear of the platform. The extra long platform and elevator chain means provide means for accumulation of bales along the length of the truck bed waiting for a worker to carry them to desired positions on the truck bed.



3,724,635

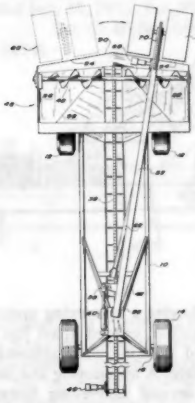
SILAGE LOADER

Wylie A. Byrd, Rt. No. 2, P. O. Box 25, Tulia, Tex.

Filed March 16, 1971, Ser. No. 124,876

Int. Cl. B65g *65/06, 65/28*

U.S. Cl. 198—9 **6 Claims**



A silage loader includes a boom which is pivotable about a vertical axis as well as swingable about a horizontal axis, thus enabling it to make two or three cuts down the face of a silage bank without moving its supporting vehicle. A V-shaped nose upon the front of the apron accommodates the pivoting boom. The loader operates completely off hydraulic power, i.e., the movement of the vehicle and the guiding of the vehicle, as well as the movement of the boom in both directions and the turning of conveyors and the reel, is all done by power transmitted to these locations by hydraulic fluid.

Improved teeth are mounted on the reel for tearing the silage from the bank.

3,724,636

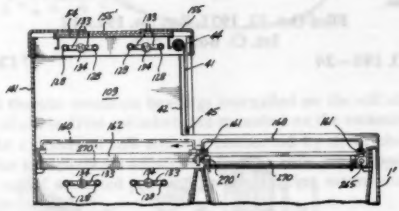
DISHWASHING MACHINE

Kenneth F. A. Wright, Westminster, Calif., assignor to Excel-tronic Industries, Ltd., Vancouver, B.C., Canada

Division of Ser. No. 801,737, Feb. 24, 1969, Pat. No. 3,530,864, which is a continuation-in-part of Ser. No. 553,862, May 31, 1966, abandoned. This application Sept. 24, 1970, Ser. No. 75,022

Int. Cl. B65g *25/00*

U.S. Cl. 198—19 **9 Claims**



A loading station, a washing station and an unloading station for dishes are arranged generally in line with a basin under each station. Stationary racks composed of parallel rods at each station can support dishes, and dishes can be moved from the loading station to the washing station and from the washing station to the unloading station by two movable racks having parallel rods interdigitated with the stationary parallel rods which can be translated lengthwise of such rods. The movable racks are movable elevationally to lift dishes from the stationary rack at one station to be transported to the stationary rack at an adjacent station. Latches can connect the two movable racks for conjoint translation. At the washing station sprays oscillating about axes extending transversely of the direction of translation of the racks wash the dishes. During such washing operation roll curtains at opposite ends of a housing over the washing station are lowered to confine the sprays.

3,724,637

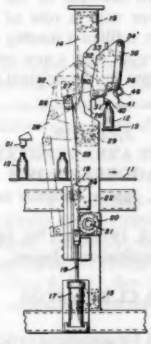
APPARATUS FOR PICK-UP AND TRANSFER OF CONTAINERS FROM LEHR CONVEYOR TO CROSS CONVEYOR

Leo Strauss, East Rockway, N.Y., and Michael J. Sobran, Old Greenwich, Conn., assignors to Glass Containers Corporation, Fullerton, Calif.

Filed May 18, 1971, Ser. No. 144,439

Int. Cl. H01h *19/00*

U.S. Cl. 198—21 **8 Claims**



An apparatus for effecting transfer of a row of glass containers from a lehr conveyor upon which aligned rows of con-

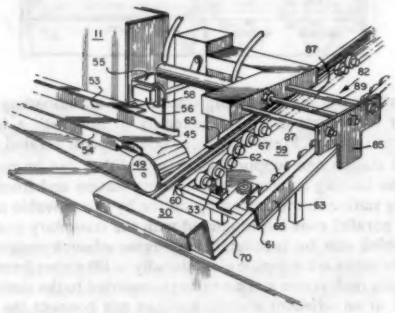
tainers are advancing, to a cross-conveyor disposed above the lehr conveyor. The cross-conveyor is in a plane parallel to the plane of the lehr conveyor. A container engaging and transfer means is movable in an arcuate path from container engaging position above the lehr conveyor to container deposition position above the cross-conveyor.

3,724,638

SAMPLE CONVEYOR AND TRANSPORT SYSTEM

Joseph C. Peters, and Louis J. Cerulo, both of Marlborough, Mass., assignors to Damon Corporation, Needham Heights, Mass.

Filed Oct. 22, 1971, Ser. No. 191,612
Int. Cl. B65g 47/06
U.S. Cl. 198—24 **7 Claims**



A conveyor and transport system for supplying a succession of racks, each containing a number of sample vials to an automatic liquid sampler, where the conveyor includes an input conveyor section, a belt transport conveyor section and an output conveyor section. The belt transport conveyor carries the racks from the input conveyor to a position under the sampling probe and thereafter to an output conveyor. The input conveyor receives a drawer containing an ordered row of racks and provides for gravity feed of these racks to a position on the conveyor adjacent to the transport conveyor, a pusher element being actuated to transfer each rack from this position on the input conveyor onto the transport conveyor. The transport conveyor discharges the racks onto a drawer positioned on the output conveyor which, the latter including a series of freely rotatable rollers which support racks delivered onto the output conveyor. An air acutated pusher element responds to the delivery of a rack onto the output conveyor by driving that rack toward the rear of the conveyor, thereby filling the output drawer with a row of already processed racks. When this drawer is filled a sensing element provides a signal stopping the conveyor until a new empty output drawer is substituted on the output for the original one.

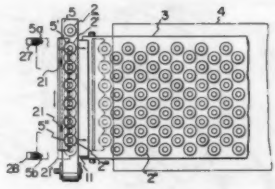
3,724,639

APPARATUS FOR ARRANGING ARTICLES IN STAGGERED ROWS

Takao Hara, Hiratsuka, Japan, assignor to Toyo Glass Company, Limited

Filed Dec. 21, 1970, Ser. No. 100,194
Claims priority, application Japan, Dec. 19, 1969, 44/101617
Int. Cl. B65g 47/26
U.S. Cl. 198—31 R **7 Claims**

Apparatus is disclosed for arranging articles which are continuously fed in a straight line condition on a feed conveyor into a staggered or zig-zag condition on a receiving conveyor while transferring the articles onto the receiving conveyor in a direction perpendicular to the advancing direction of the feed conveyor. The apparatus comprises a movable arm reciprocating in the direction of movement of the receiving conveyor, a sliding frame slidable in a direction perpendicular to the movement of the arm and having a feeding plate for



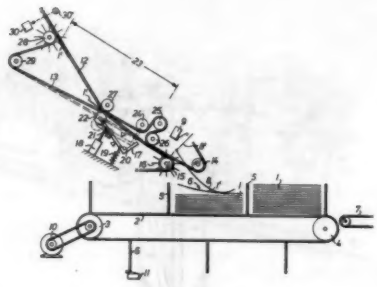
pushing the articles from the feed conveyor onto the receiving conveyor, and means for driving the sliding frame to slide it with respect to the movement of the movable arm so that it cyclically feeds a predetermined number of articles from the feed conveyor onto the receiving conveyor.

3,724,640

DEVICE FOR FORMING STACKS FROM A FLOW OF CONSECUTIVELY FURNISHED FLAT ITEMS

Hans Rapparlie, Konstanz, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed March 23, 1971, Ser. No. 127,287
Claims priority, application Germany, March 23, 1970, P 20 13 810.7
Int. Cl. B65h 7/00
U.S. Cl. 198—35 **11 Claims**



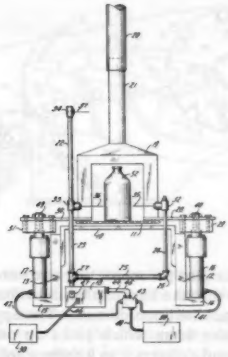
A stacking device having a conveying system for continuously advancing individual, spaced apart flat items, such as pieces of mail, toward stacking compartments carried on a second conveying system. A monitoring and control system is associated with the second conveying system to move a stacking compartment that has been filled with stacked items away from the conveying system and move an empty compartment into a position for filling. An abutment means is disposed to be movable in response to signals from the monitoring and control system to interrupt the flow of items toward the stacking compartment during a hold time involved during the movement of empty and filled compartments. A buffer area is provided in the conveying system ahead of the interrupting abutment means in which the items are stacked during the hold time. The monitoring and control system is also effective, at the end of the hold period, to move the abutment means from an operative position to a rest position so that the conveying system accelerates the movement at the stack of items in the buffer area as a unit to the operatively positioned empty compartment.

3,724,641

AUTOMATIC HOT END COATING HOOD LIFTER

Ralph E. Wainwright, Elmira, and Edward R. Liston, Millport, both of N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed June 14, 1971, Ser. No. 152,940
Int. Cl. B65g *43/00*
U.S. Cl. 198—40 5 Claims



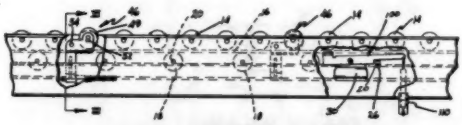
A device for automatically lifting a hood covering a conveyor so that an article in an improper position on the conveyor will not strike the hood. The device comprises a means for detecting an article in an improper position which activates a means for lifting the hood.

3,724,642

ACCUMULATOR WITH BRAKING

Maynard J. De Good, Grand Rapids, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed July 30, 1971, Ser. No. 167,600
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 R 7 Claims



This invention describes a powered roller, accumulator conveyor having a powered propelling member passing through a plurality of independent accumulating zones arranged along the conveyor. The propelling member is shiftable between driving and non-driving positions with respect to the powered rollers. A brake means engages the powered rollers to stop their rotation when the propelling member is shifted to a non-driving position, thereby preventing movement of articles along the conveyor.

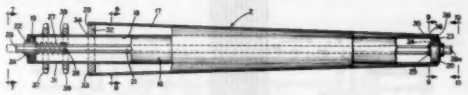
3,724,643

TAPERED ROLL CONVEYOR CURVE CONSTRUCTION

Robert E. Kohl, Manlius, N.Y., assignor to Diebold, Incorporated, Canton, Ohio

Filed June 28, 1971, Ser. No. 157,478
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 R 9 Claims

A power driven material handling conveyor curve section having an improved tapered roll construction mounted therein. A tapered sleeve is fixed to a section of or all of a usual cylindrical conveyor roll. A portion of the cylindrical roll or section extends out beyond the large end of the tapered sleeve. The roll shaft is non-rotatably mounted in a support frame, and the cylindrical roll or section and tapered sleeve



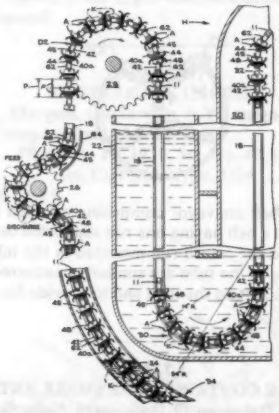
fixed thereto rotate on bearings journalled on the roll shaft. A pair of chain drive sprockets are mounted on the extended end of the cylindrical roll and are connected by drive chains to similar sprockets on adjacent rolls. The rolls are snapped into and out of mounted position by usual spring means mounted within the roll.

3,724,644

UNIVERSAL CARRIER CHAIN FOR COOKERS

James L. Reimers, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed July 13, 1971, Ser. No. 162,078
Int. Cl. B65g *17/00*
U.S. Cl. 198—131 8 Claims



A short pitch conveyor chain for hydrostatic cookers has stop fingers on alternate links and back to back C-shaped carrier members that can be employed with spacer blocks to form pockets that accommodate a range of can sizes without changing the conveyor chains.

3,724,645

CONVEYOR BELT CONSTRUCTION

Gerd Spaar, Cologne, Germany, assignor to Clouth Gummiwerke Aktiengesellschaft, Cologne, Germany

Filed May 4, 1971, Ser. No. 140,061
Claims priority, application Germany, May 5, 1970, P 20 21 947.0
Int. Cl. B65g *15/36*
U.S. Cl. 198—193 3 Claims

Two conveyor belt portions which are reinforced with cables, are connected with one another. The cables are arrange

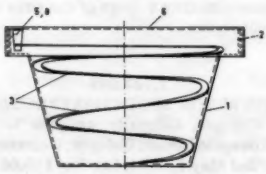
din groups of three or four and have end portions of different lengths. According to the invention every end-portion in each group of one conveyor belt portion — except for the shortest portion of the group — is located (when the portions are con-

nected with one another) between two end portions of cables of the other portion, and the shortest end portion of the group is located adjacent the longest end portion of the group with which it is connected.

3,724,646
ENDLESS BELT CONVEYOR
Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio
Filed Feb. 19, 1970, Ser. No. 12,676
Int. Cl. B65g *15/40*
U.S. Cl. 198—201 **3 Claims**

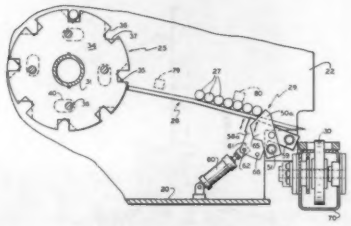
An endless belt conveyor comprising an open ended elongated tube and a belt having one run supported on the surface of the tube and the return run mounted in the tube. The belt and the surface of the tube are similarly contoured to provide stability for the belt on the tube and to provide for transport of specific loads.

3,724,647
STORAGE CONTAINER FOR SMALL ARTICLES
Johan Ledoux, Dalwagen 47, Dodewaard, Netherlands
Filed May 11, 1971, Ser. No. 142,204
Int. Cl. B65d *83/04*; B65g *27/02*
U.S. Cl. 198—220 BC **3 Claims**



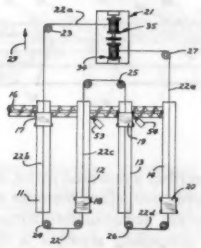
A storage container for small articles, such as lozenges, which container at the same time may be used as a vibrator bowl of an apparatus for issuing the articles one by one. The container is preferably made of plastic material and provided at its interior wall with a spiral or helix shaped raising track.

3,724,648
BAR FEEDER APPARATUS
Robert L. Schaller, Syracuse, N.Y., assignor to Sundstrand-Engelberg, Inc., Liverpool, N.Y.
Filed April 14, 1971, Ser. No. 133,912
Int. Cl. B65g *25/08*
U.S. Cl. 198—211 **2 Claims**



Bar feeder apparatus for separating one bar at a time from a supply of bars so that the bars can be individually delivered to a bar working machine upon demand. The apparatus includes a rotatable transfer drum which picks up one bar at a time from the supply and delivers it to a downwardly inclined rack, the pick-up means of the drum being adjustable to enable it to accept bars of different diameters. At the lower end of the rack means are provided to retain the bars in a row on the rack, the retainer means also being adjustable for bars of different diameters. Cooperating with the retainer means is an actuator mechanism for releasing one bar at a time from the rack for delivery to the bar working machine.

3,724,649
REEL WINDER APPARATUS
Richard H. Ayres, Minneapolis, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.
Filed June 1, 1971, Ser. No. 148,767
Int. Cl. B65g *25/08*
U.S. Cl. 198—224 **9 Claims**

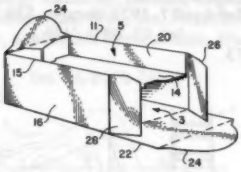


For a barn, shed or the like having a plurality of spaced troughs emptying onto a conveyor, for example an auger, a cart in each of said troughs, cable mechanism attached to each cart for moving one cart in an opposite direction to the next adjacent cart and reel rewind apparatus attached to the cable mechanism for driving the cable mechanism, said reel apparatus including a pair of reels mounted in fixed axial positions on the shaft for rotation relative thereto, a reversible motor driving, a sprocket rotatably and axially movably mounted on the shaft between the reels, and lugs on the reels and sprocket for moving the sprocket out of driving relationship with the lug on one reel and into driving relationship with a lug on the other reel when the direction of the motor drive is reversed, and control circuitry for the motor.

3,724,650
MULTI-PRODUCT CARTON

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed April 23, 1971, Ser. No. 136,917
Int. Cl. B65d *5/50*
U.S. Cl. 206—45.19 5 Claims

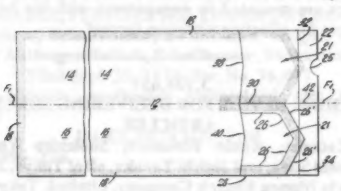


A dual compartmented carton adapted to hold two or more items that might be of different size and shape wherein the carton contains an exposed tray-like upper portion for packaging one or more of the items completely visible to the consumer, and an enclosed lower portion for packaging the other items. The carton is constructed from a one-piece blank of material such as paperboard or the like so that the two portions are isolated from one another by a carton partition element or panel.

3,724,651
PEELABLE SURGICAL PACKAGE

Martin Link, North Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed March 3, 1971, Ser. No. 120,431
Int. Cl. B65d *17/24*, *83/00*
U.S. Cl. 206—56 AA 15 Claims

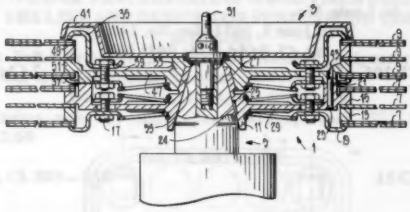


A peelable package is provided for containing surgical articles and devices which may be sealed and sterilized within the package and subsequently removed therefrom with a minimum probability of contamination by the unsterile outer surfaces of the package. The package comprises two panels sealed together at their marginal portions to form a chamber therebetween having a sealed mouth and adjacent sealed edges. A section of the sealed marginal portions of one panel, extending across the mouth and along the adjacent edges of the package, is weakened, as by scoring, so that upon the package, the weakened section of the panel will delaminate to the depth of the scoring in preference to yielding at the seal. The package is additionally provided with tabs extending beyond the sealed mouth. The tabs include bending scores which allow them to be folded away from the sterile portions of the package and additionally initiate the delamination of the panel when opening the package.

3,724,652
TWIN DISC PACK

Joseph P. Francini, Castro Valley, and Michael A. Verdone, Hillsborough, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed June 14, 1971, Ser. No. 152,796
Int. Cl. G11b *1/02*
U.S. Cl. 206—62 P 35 Claims

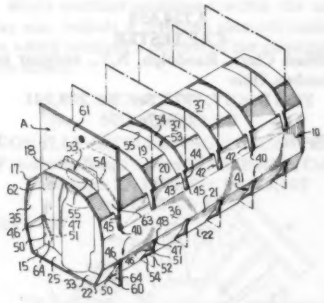


A twin disk pack assembly comprising a first or lower disc pack and a second or upper disk pack. Each disk pack has a number of stacked discs coaxially mounted on a hub in spaced apart relation. Each of the discs has a magnetic recording surface for storing information. The lower disk pack is first placed on the spindle and then the upper disk pack is placed on the spindle and secured thereto. The lower disc pack is provided with a fixed drive pin that is adapted to be inserted into a hole located in the hub of the upper disk pack. Visible indexing symbols are placed on the surface of the uppermost disc of each disk pack to facilitate the engagement of the drive pin in its mating hole. In addition, stabilizer pins are provided to preventing tipping of the upper disc pack before the drive pin has been engaged.

3,724,653
BLISTER PACK CARRIER

Nicholas V. Morgese, Garnerville, N.Y., assignor to Continental Can Company, Inc., New York, N.Y.

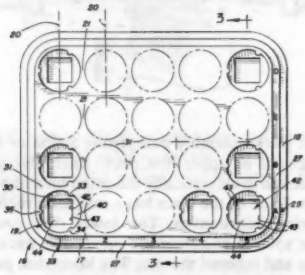
Filed June 19, 1970, Ser. No. 47,256
Int. Cl. B65d *71/00*, *5/04*
U.S. Cl. 206—65 R 6 Claims



This disclosure relates to a package for carrying a plurality of blister packs or similar articles which normally include relatively thin and flat peripheral margins and an inboard chamber formed by the so-called blister in which may be housed, as an example, a bottle or similar container filled with pills, liquid or most any type merchantable product. The package includes a wrap-around type carrier having respective inner and outer closure panels, a pair of spaced side panels, and a top panel. Each side panel includes a plurality of aligned pairs of slots with the slots interlockingly receiving the flat marginal positions of the blister packs or similar articles for maintaining the same interlocked to the carrier and in spaced relationship to

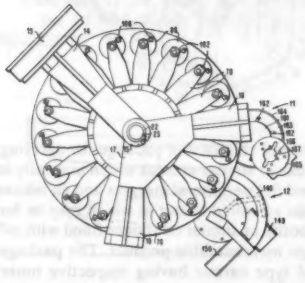
each other. In the embodiment illustrated the top panel is provided with a slot for interconnecting each uppermost pair of slots of the side panels to permit an uppermost flat marginal portion of the blister pack to project therethrough.

3,724,654
CUP TRAY AND CONTAINER
William L. Gerard, Overland, Mo., and Jack E. Pregont, Janesville, Wis., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed June 1, 1971, Ser. No. 148,438
Int. Cl. B65d *1/36*; B01l *3/00*
U.S. Cl. 206—72 **7 Claims**



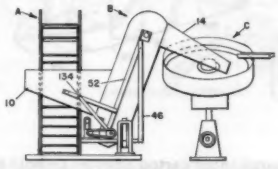
A tray for holding a plurality of sample cups having different top and bottom configurations in either an upright or an inverted position including a top tray member having a plurality of rows of recesses with each of the recesses having a circular portion with radial projections for engaging and holding the cups in an inverted position, and a rectangular portion for holding the base of the cups so that the cups are in an upright position. The tray is provided with a flat bottom member fixed to the top member so that the trays with the cups held therein may be stacked and slid laterally easily with respect to one another. Also provided is a container having a side opening therein to permit one of a stack of trays with or without the cups assembled therewith to be removed therefrom through the side opening whereupon the trays thereabove drop down one step at a time.

3,724,655
CAP TESTER
Charles William Clark, Randolph, N.Y., assignor to Borden, Inc., Columbus, Ohio
Filed Dec. 17, 1971, Ser. No. 209,041
Int. Cl. B07c *5/06*
U.S. Cl. 209—73 **11 Claims**



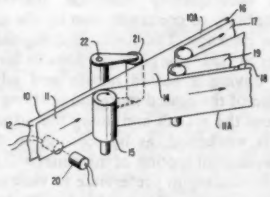
Apparatus for testing thickness of gaskets in caps and for rejecting caps which have gaskets of a thickness outside of a set range, the apparatus being characterized by a first sensing means responsive to gas leaking through the gasket which tests for a minimum set thickness, a second sensing means which is actuated by a floating head when it encounters a gasket exceeding the maximum set thickness and a sorting means which is responsive to the first and second sensing means to eject caps with non-specification gaskets.

3,724,656
SEPARATING AND SORTING APPARATUS
Walter S. Sterling, Quincy, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.
Filed April 7, 1971, Ser. No. 131,914
Int. Cl. B07c *1/04*
U.S. Cl. 209—73 **32 Claims**



Apparatus for sequentially separating and distributing items from a mixed relatively compact mass of items having appendages so intertwined as to make separation difficult, comprising tandemly arranged separators for successively operating on the mass. Each separator apparatus has a hopper and an elevator. The elevator in the first separator loosens items from the initially compact mass and transfers random complements to the hopper of the second separator where they collect in the form of a loose mat. The elevator of the second separator loosens the items in the mat and transfers continuous complements to the hopper of a sorting apparatus. The hopper of each apparatus has a sloping bottom so that the mass gravitates toward its lower end and the elevator of each separator comprises a conveyor situated at the lower end of the hopper which extends upwardly relative to the bottom and has fixed to it a plurality of spaced parallel flights operable by movement upwardly relative to the bottom of the hopper to effect oscillation of the mass so as to loosen items in the mass. Eccentrics are mounted in engagement with the bottoms of the hoppers for effecting vibration thereof.

3,724,657
SWITCHING DEVICE FOR DELIVERING SHEET-LIKE ARTICLES
Takeo Katagiri; Kunio Hiromori; Shoichiro Yoshimura; Kazuyoshi Suda, and Jinichi Tanaka, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan
Filed May 14, 1971, Ser. No. 143,366
Claims priority, application Japan, May 16, 1970, 45/41795; May 16, 1970, 45/41798
Int. Cl. B07c *3/06*
U.S. Cl. 209—74 **7 Claims**



A switching device for interswitching the delivery of sheet-like articles conveyed to a bifurcation through a feed route, between the main and the branch routes, each route being formed of the opposing surfaces of a pair of endless belts,

comprising, instead of the conventional wedge-shaped switching member disposed within the bifurcation, a switching member located outside the bifurcation. The device may be provided with means for rearranging the dislocated sheet-like matters, if any.

3,724,658

PARTICLE SEPARATION IN A GASEOUS FLUID

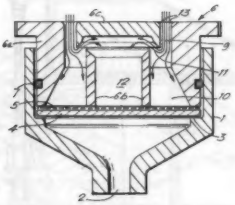
John Stephenson, Cholsey, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed March 20, 1970, Ser. No. 21,342

Claims priority, application Great Britain, March 27, 1969, 16,246/69

Int. Cl. B07b 7/086

U.S. Cl. 209—143 **4 Claims**



Apparatus for separating particulate matter from a gas, particularly dust from air, selectively according to particle size comprising an inlet passage, a duct in-line with the inlet passage and a re-entrant branch duct into which a predetermined fraction of the gas is diverted, the change of direction of flow of said fraction being such that only smaller particles remain entrained therein and larger particles due to inertial and centrifugal forces are not diverted and are entrained in the undiverted fraction of the gas stream together with the particles entrained in said undiverted fraction. The apparatus may be adapted to provide a lung model simulator.

3,724,659

TRANSPORT SYSTEM FOR CASTINGS INCLUDING A SWINGABLE, PERFORATED TRANSPORT BUCKET

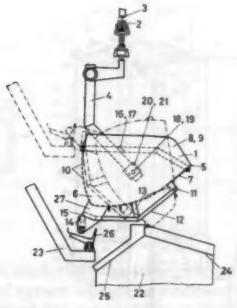
Erwin Buhrer, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhauser, Switzerland

Filed Sept. 29, 1970, Ser. No. 76,477

Claims priority, application Switzerland, Oct. 6, 1969, 14975/69

Int. Cl. B07b 1/28, 1/46

U.S. Cl. 209—238 **5 Claims**



Swingable transport buckets are supported on a track; the buckets have a bottom wall which is perforated and a catch tray is located beneath the bottom wall spaced therefrom to catch sand and the like from the castings as they are being transported in the buckets. The front lip of the bucket extends beyond the front lip of the catch tray so that, upon tipping of the bucket at a discharge station, the castings will fall out of the bucket at a point remote from the sand falling off the tray. The discharge station is formed with inclined surfaces, extending in different directions, to separate the sand and the castings.

3,724,660

METHOD OF FRACTIONATING WOOD FIBER PULP OR THE LIKE AND DEVICE FOR PERFORMING THE METHOD

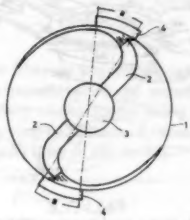
Erik Folke Eriksson, Johanneshov, Sweden, assignor to AB Calor & Celsius, Solna, Sweden

Filed April 22, 1970, Ser. No. 30,930

Claims priority, application Sweden, April 22, 1969, 5722/69

Int. Cl. B07b 1/00

U.S. Cl. 209—250 **15 Claims**



A method of fractionating a fibrous suspension or the like in which a curved perforated stationary screen and at least one stationary nozzle are utilized to divide the suspension into a fine fraction and a coarse fraction. The nozzle directs the suspension as a spray against an impact surface and in a direction parallel to the concave surface of the screen. Substantially only a fine fraction of the suspension is passed through the perforations in the screen at a portion of the screen removed from the impact surface, while the coarse fraction of the suspension is lead toward a rejection outlet.

A device for performing the fractionating method in which the impact surface is constituted by an imperforate portion of the concave surface of the screen or is constituted by an imperforate shield member positioned within the screen. The device may also include a diverting element associated with the screen which receives a portion of the suspension passing through the screen.

3,724,661

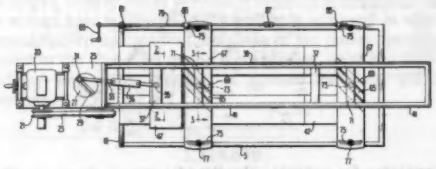
DIAGONALLY OSCILLATING CONCENTRATOR

Edmond F. Gobatti, Route 3, Box 252 A, Pueblo, Colo.

Filed Sept. 17, 1970, Ser. No. 73,109

Int. Cl. B03b 3/12

U.S. Cl. 209—437 **2 Claims**



A concentrator of the sluice trough type reciprocates bodily along a path diagonal to the length of the trough. Horizontal plates carrying diagonal guideways thereon guide the trough at points spaced lengthwise of the trough, the plates and hence the guideways being adjustable about vertical axes that

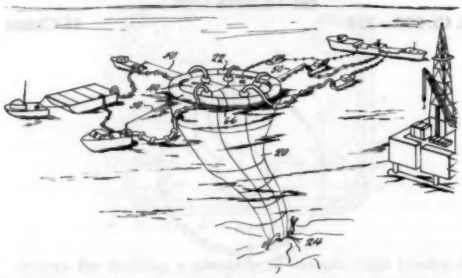
transect the midpoints of the reciprocatory path, by means of a horizontal rod common to all the plates and extending parallel to the trough and rotatable to swing the plates in unison about their vertical axes. The rod is pivotally connected to the plates and to the trough support and portions of the rod are universally connected to each other between the plates.

3,724,662

CONTROL OF OIL POLLUTION AT SEA, APPARATUS AND METHOD

Angel J. Ortiz, Calle Rio Guadalquivir No. 30, Mexico City, Mexico

Filed March 12, 1971, Ser. No. 123,779
Int. Cl. B01d *21/00*
U.S. Cl. 210—83 **26 Claims**



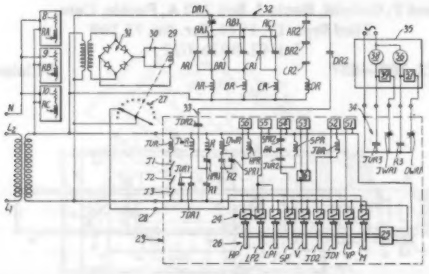
Massive oil spills from tankers or offshore wells and small spills from bottom crevices are eliminated by confining the oil right at the spill source, before it becomes a slick, by means of a marine pollution control system which includes a huge plastic bag from which oil is pumped from the bag to a receiving facility. The marine pollution control system, also referred to as <MPCS>, is a preventive and contingency constituting a complete, self-contained, light and mobile system of men and equipment that can be deployed on very short notice for oil spill containment anywhere in the world.

3,724,663

TUBE PRESSURE FILTERS

Ralph Derek Gwilliam, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, St. Austell, Cornwall, England

Filed Feb. 2, 1971, Ser. No. 111,970
Claims priority, application Great Britain, Feb. 11, 1970, 6,698/70
Int. Cl. B01d *29/36*
U.S. Cl. 210—85 **7 Claims**



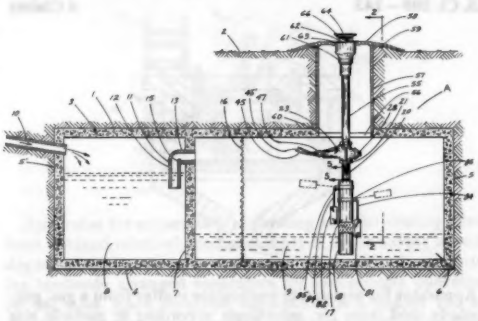
Apparatus for reducing the liquid content of wet, particulate, solid material comprises at least one tube pressure filter having relatively movable, co-axial tubular bodies in association with an arrangement comprising a radiation source for directing a beam of radiation across the intended path of discharging filter cake, a receiver for the beam downstream of said path and sensing means coupled to the receiver for sensing interception of said beam by a filter cake and coupled to sense relative displacement of said tubular bodies, to determine whether filter cake has been discharged from said filter in an operation cycle of said filter.

3,724,664

SEWAGE TREATMENT SYSTEM

Robert A. Lemberger, Vienna, and Jerry L. Gilmore, Rolla, both of Mo., assignors to Missouri Engineering Corporation, Rolla, Mo.

Filed Jan. 25, 1971, Ser. No. 109,233
Int. Cl. B01d *21/24*
U.S. Cl. 210—104 **14 Claims**



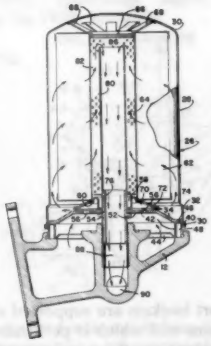
A sewage treatment system especially adapted for residential usage comprising a below ground tank having a settlement chamber for receiving raw sewage, and an aeration chamber in communication therewith; there being a submersible pump within said aeration chamber, an above ground sprinkler, and a control valve connecting said sprinkler and said submersible pump. Said valve is of two position character; in one position, effluent is recirculated within said aeration chamber, and in said other position, effluent is discharged through said sprinkler for dispersion within the surrounding area; and means being provided for entraining air into effluent during recirculation. The operation of said control valve, together with said pump, is governed by timing means.

3,724,665

FILTER UNIT

Robert L. Hall, Mount Carmel, Ill., assignor to Champion Laboratories, Inc., West Salem, Ill.

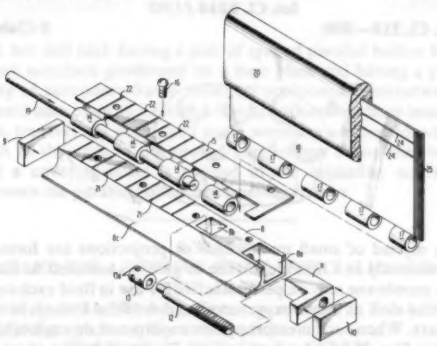
Filed April 1, 1971, Ser. No. 130,385
Int. Cl. B01d *27/10, 27/08*
U.S. Cl. 210—130 **3 Claims**



A filter unit comprising a cylindrical casing with a plate member closing off one end thereof and having oil inlet port

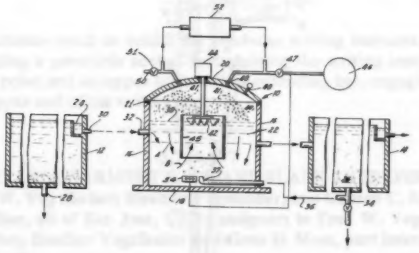
means and oil discharge means therein and gasket means for seating the filter unit on a pedestal or base mounted on a vehicle engine with threaded means for securing the filter unit to the pedestal or base, and with a standpipe extending centrally of the casing with an annular filter element disposed therearound and with check valve means disposed in the casing adjacent the plate member and a bypass valve disposed within the center tube of the filter element.

3,724,666
UNIVERSAL REPLACEABLE WEIR ASSEMBLY
Clarence S. Johnson, P. O. Box 940, Pomona, Calif.
Filed April 9, 1971, Ser. No. 132,639
Int. Cl. E04h *3/20*; E05d *7/00*
U.S. Cl. 210—169 **9 Claims**



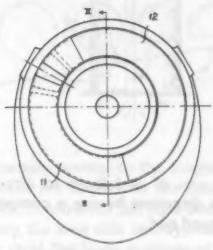
A weir assembly for use in a swimming pool skimmer wherein the weir assembly includes individually replaceable components including a buoyant weir plate hingedly connected to an expandable anchor block mounted within the skimmer inlet, the various components of the weir assembly being constructed and arranged to be fabricated at the job site whereby the assembly is adapted to fit all types and makes of skimmers.

3,724,667
ACTIVATED SLUDGE PROCESS AND SYSTEM
Ross E. McKinney, Lawrence, Kans., assignor to Air Products & Chemicals, Inc., Allentown, Pa.
Continuation of Ser. No. 42,271, June 1, 1970, abandoned. This application Oct. 28, 1971, Ser. No. 193,604
Int. Cl. C02c *1/10*
U.S. Cl. 210—195 **5 Claims**



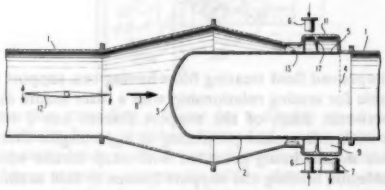
An activated sludge sewage treatment process and system: the process and system include an enclosed aeration chamber providing a vessel for a mixed liquor formed from a liquid biologically degradable waste and recirculated sludge, with an upper region in the enclosed chamber into which droplets of the mixed liquor are generated and a gas containing a major portion of oxygen is injected under pressure. The gas in the upper region is maintained under pressure and oxygen is transferred to the droplets and mixed liquor at an improved rate.

3,724,668
ADJUSTABLE SKIP BRIDGE VALVING MECHANISM FOR DISC FILTER
Harry Richard Ahlquist, Babbitt, Minn., assignor to Erie Development Company, Cleveland, Ohio
Filed Jan. 27, 1971, Ser. No. 110,003
Int. Cl. B01d *33/26*
U.S. Cl. 210—331 **2 Claims**



In operating a disc filter an improved control of the dryness of the filtercake is obtained when the vacuum bridging is extended to the extremity of the sector being totally out of the slurry and then "skipping" a portion of vacuum bridging at the lower (i.e., submerged) level of the sector.

3,724,669
SCREEN INSTALLATION
Heinz Thal, Lintorf, Germany, assignor to Ludwig Taprogge, Reinigungsanlagen fur Rohren-Warmeaustauscher, Dusseldorf, Postfach, Germany
Filed May 20, 1971, Ser. No. 145,436
Int. Cl. B01d *29/42*
U.S. Cl. 210—409 **33 Claims**

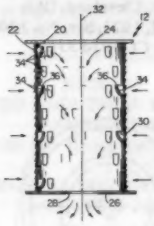


A screen installation for separating solid materials from liquid streams in pipe lines, in which a screen basket is so arranged that its closed end is directed opposite the flow and its open end is connected with the pipe line wall; at least one tangentially outwardly directed flushing medium inlet opening and flushing medium outlet opening each are arranged near the screen base whereby the outlet opening is disposed nearer the screen base while the inlet opening is arranged in another plane disposed upstream of the plane of the outlet opening, as viewed in the direction of the main stream, so that a flushing medium separation channel is formed between the two openings.

3,724,670
SEPARATING FLUIDS
John William Gernhardt, Tulsa, Okla., assignor to Fram Corporation, East Providence, R.I.
Filed Feb. 12, 1971, Ser. No. 115,027
U.S. Cl. 210—448 **5 Claims**

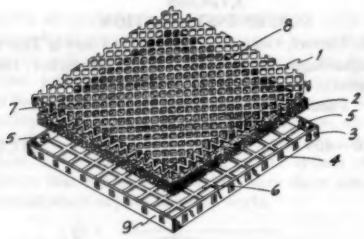
Separator for immiscible fluids having a closed end and an outlet spaced along an axis, a separating medium arranged

with inlet and outlet faces generally parallel to the axis so that fluid having passed through the medium flows along the axis toward the outlet, and a multiplicity of flow-directing surfaces



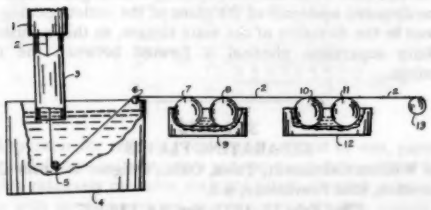
arranged adjacent one of said faces to direct fluid entering said separator in a direction having a component along said axis toward said closed end.

3,724,671
FLUID TREATING FILTER
John E. Tate, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.
Filed Feb. 4, 1971, Ser. No. 112,628
Int. Cl. B01d *27/08*
U.S. Cl. 210—484 **10 Claims**



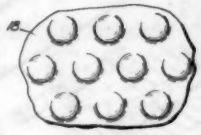
An improved fluid treating filter having two support frames adaptable for mating relationship with a filter media disposed therebetween. Each of the support frames has a retaining screen with side means projecting at right angles therefrom, said side means being provided with snap means which are adaptable for holding the support frames in said mating relationship.

3,724,672
ASYMMETRIC HOLLOW FIBER MEMBRANES AND METHOD OF FABRICATION
Richard Lloyd Leonard, 111 Dunedin Ct., Cary, N.C., and John Darrell Bashaw, 317 Wesley Dr., Chapel Hill, N.C.
Filed July 27, 1970, Ser. No. 58,509
Int. Cl. B01d *39/00*
U.S. Cl. 210—500 **4 Claims**



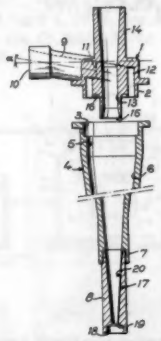
This invention is directed to hollow filament membranes derived from esters of cellulose and characterized by a density gradient in the filament wall structure. When employed in reverse osmosis operations the filaments exhibit extraordinary flux and rejection properties. A continuous fabricating method is also provided which comprises continuously extruding filaments into a controlled evaporation zone thence directing the filaments into a cold water coagulation bath, thereafter passing the same to a wash bath and finally to an annealing zone.

3,724,673
TEXTURED MEMBRANES FOR BLOOD DIALYZERS OXYGENATORS AND THE LIKE
David M. Ryon, Scotia, N.Y., assignor to General Electric Company
Filed Aug. 28, 1970, Ser. No. 67,753
Int. Cl. B01d *31/00*
U.S. Cl. 210—500 **9 Claims**



A myriad of small undulations or projections are formed permanently in a thin membrane to give it a textured surface. The membrane may be permselective for use in fluid exchange devices such as blood oxygenators and artificial kidneys or dialyzers. When such membranes are superposed on each other, a thin film of blood or other fluid flowing between them is gently agitated by the textured surface to enhance the absorption of a gas such as oxygen which is transported through the membrane. The textured surface prevents adjacent membrane layers from adhering. The textured surface is created by heating, vacuum forming and cooling on a suitable die.

3,724,674
HEADS FOR HYDROCYCLONIC SEPARATORS
Robert Loison, 15 Allee du Colombier Domaine de Grandchamp, Le Peco, France
Filed June 30, 1970, Ser. No. 51,294
Claims priority, application France, July 3, 1969, 6922521
Int. Cl. B01d *21/26*; B04c *3/06*
U.S. Cl. 210—512 **5 Claims**



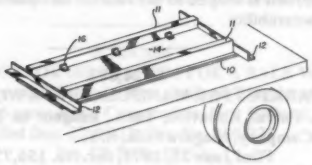
This invention relates to improvements in hydrocyclonic separators for separating or concentrating solid particles suspended in a liquid, wherein it has a head comprising an inlet nozzle for the liquid to be treated, an outlet nozzle for the treated liquid and means for guiding the liquid to the inlet, said head being able to receive bodies of hydrocyclonic separators of different conicities and shapes.

3,724,675

HOT COIL RACK

Jerry L. Stoneburner, P. O. Box 277, North Jackson, Ohio

Filed June 9, 1971, Ser. No. 151,180
Int. Cl. A47f 7/00
U.S. Cl. 211—13 4 Claims



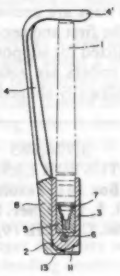
A hot coil rack having a pair of spaced parallel hollow box frame members positioned on a base plate and having a plurality of secondary frame members positioned therebetween on said base plate along with a blanket of ceramic fiber insulation, transversely positioned angle members are positioned at each of the ends of the spaced parallel box frame members and a covering sheet is applied to the insulating material between the parallel hollow box frame members.

3,724,676

STAND FOR A WRITING POINT, ESPECIALLY FOR TUBULAR PENS

Gerold Anderka, Hamburg, Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed March 12, 1971, Ser. No. 123,745
Claims priority, application Germany, May 5, 1970, G 70 16 831.9
Int. Cl. B43k 31/00
U.S. Cl. 211—69.7 2 Claims



A tiltable stand or holder for a tubular writing instrument, including a pivotable socket for retaining the writing instrument point and an upper horizontally extending bar, engaging the upper end of the writing pen.

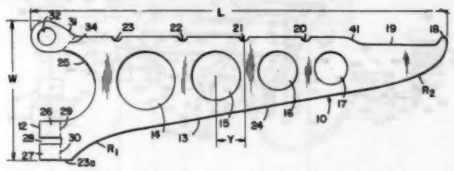
3,724,677

PORTABLE GARMENT RACK AND BLANK THEREFOR

Fred W. Vogelhuber; Heather Vogelhuber, and Gilman C. McMillan, all of San Jose, Calif., assignors to Fred W. Vogelhuber; Heather Vogelhuber and Gene D. Moss, part interest to each

Filed Aug. 25, 1971, Ser. No. 174,713
Int. Cl. A47f 5/08
U.S. Cl. 211—96 14 Claims

A portable garment rack is disclosed which can be stamped from a blank, bent into shape and releasably mounted on the hinge pin of a door hinge. The rack is a rigid unitary planar body generally in the form of an elongated right triangle. A recess is disposed in the long side of the right angle forming the triangle and extends from a point near the outer apex of the triangle to a point along the long side spaced from the short side of the triangle. Hinge pin engaging means is associated with the short side of the triangle for engaging the hinge pin of the door hinge and maintaining the rack in a fixed position relative thereto with the plane of the body extending



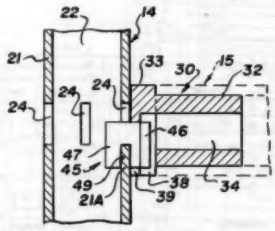
in a direction generally normal to the longitudinal axis of the pin. Aperture means are formed in the body of a shape and size so as to provide continuous flat rigid body portions of substantial width along the long side and hypotenuse of the triangle connected by rigid flat body portions of substantial width parallel to the short side of the triangle.

3,724,678

FRAME CONSTRUCTION

Herbert Challier, 5930 Falcon Road, West Vancouver, British Columbia, Canada

Filed Jan. 20, 1972, Ser. No. 219,309
Int. Cl. A47f 5/01; F16b 7/04, 9/02
U.S. Cl. 211—148 9 Claims



Construction providing a frame for a display stand or the like and utilizing frame members formed of square plastic tubing having slotted side walls. A connector clip attachable to an upright frame member cooperates with a slotted plug enterable into an end of a horizontal frame member to provide means for joining one member to another. The construction includes hanger clips for shelves carried by the frame and support clips for vertically disposed side wall panels enclosing parts of the frame with both of these clips being received in side wall slots of the frame members. The frame construction includes reinforcing rods which can be inserted into the plastic frame members to strengthen them where required.

3,724,679

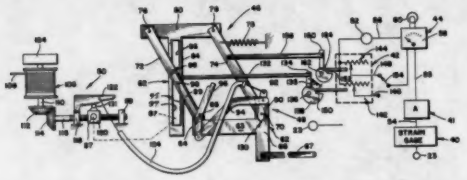
INDICATOR OR CONTROL FOR CRANES

Roy D. Brownell, Aurora, and Richard E. Rogers, Oswego, both of Ill., assignors to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 799,739, Feb. 17, 1969, abandoned. This application Feb. 19, 1971, Ser. No. 116,994
Int. Cl. B66c 13/48
U.S. Cl. 212—39 MS 4 Claims

A safe load indicator for a mobile crane including an extensible boom, the indicator including a strain gage means to provide an electrical signal reflecting total load moment about the boom horizontal pivot axis and linkage means moveable in accordance with boom movement to modify the signal according to boom vertical angle and length. To achieve an accurate in-

dication of maximum permissible load moment throughout the full operational range of the boom, linkage movement modifying means is provided to interrupt or reverse linkage



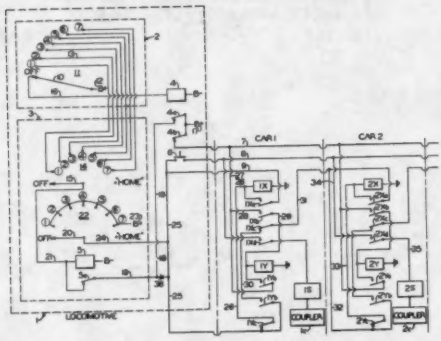
movement responsive to departure of the boom from an operational range wherein crane stability is critical and entry into an operational range wherein structural strength of the crane components is critical.

3,724,680

REMOTE CONTROL SYSTEM FOR AUTOMATIC CAR UNCOUPLING DEVICE

Claude M. Hines, 111 Foxglove Lane, Columbia, S.C.

Filed Dec. 16, 1970, Ser. No. 98,603
Int. Cl. B61g *1/08, 1/16, 3/08*
U.S. Cl. 213—212 **3 Claims**



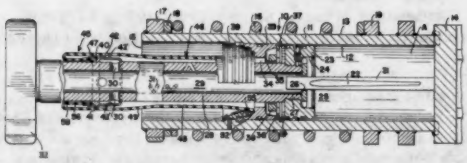
An electrical scheme utilizing circuitry including relays and contacts thereof selectively energized under the control of stepping switches to individually energize solenoid valves throughout a train to perform localized control functions such as car uncoupling operations.

3,724,681

HYDRAULIC CUSHIONING UNIT WITH BOOT TYPE ACCUMULATOR

Steven A. Anderson, Elwood, Ill.; Eugene C. Barker, and Tung Han Yang, both of Munster, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed March 26, 1971, Ser. No. 128,289
Int. Cl. B61g *9/08, 9/16*
U.S. Cl. 213—43 **5 Claims**



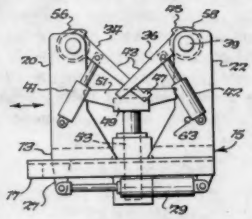
A hydraulic cushioning unit for railway cars includes a cylinder with a piston and piston rod assembly reciprocable therein and which during cushioning operation provides for the flow of fluid between chambers and through an orifice and through the piston rod to a low pressure reservoir. The reservoir or accumulator is a flexible boot type having one end connected to the cylinder and the other end secured to the piston rod. Fluid is directed from the piston rod through a deflector against an inner cylindrical surface of the boot type reservoir. The reservoir is shaped to provide for an optimum in efficiency and wearability.

3,724,682

APPARATUS FOR MANIPULATING A WORKPIECE

John L. Parris, Knoxville, Tenn., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed June 25, 1971, Ser. No. 156,770
Int. Cl. B65g *7/00*
U.S. Cl. 214—1 QG **20 Claims**



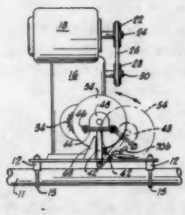
In an apparatus for manipulating workpieces, especially billets of various sizes and shapes, a first frame includes a plurality of arms pivotably mounted for movement about a first axis and a second frame includes a plurality of arms pivotably mounted for movement about a second axis which is substantially parallel to and spaced from the first axis. The second frame is movable toward and away from the first frame so that workpieces of various sizes are accommodated. A supporting surface intermediate the first and second frame which may be raised or lowered is utilized for supporting slabs during turning thereof. At least two rollers are rotatably mounted on each frame for turning cylindrically-shaped workpieces.

3,724,683

APPARATUS FOR LANDING PIPE

Donald R. Boyd, P. O. Box 141, Texola, Okla.

Filed Oct. 1, 1970, Ser. No. 77,127
Int. Cl. E21b *19/14*
U.S. Cl. 214—2.5 **13 Claims**



Apparatus for landing pipe stands during the pulling of a drill string from bore holes, such apparatus comprising a prime mover connected through a kinematic chain to a drive shaft having a drive gear keyed thereto and adapted to be mounted on the monkey board of an oil well derrick. Also adapted to be mounted on the monkey board in proximity to the drive shaft with the gear keyed thereto is a winch assembly which is pivotally mounted for oscillatory movement about a horizontal axis. The winch assembly includes a winch drum which is keyed to a shaft which is rotatably journaled and car-

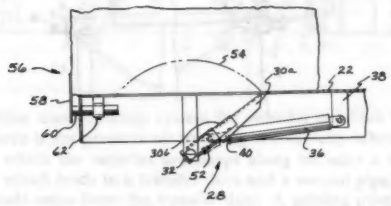
ries at one end, a gear which is aligned, and adapted to mate, with the drive gear carried by the drive shaft. A cable rope is deadended to the winch. A pivoted stop arm assembly may be used to retain the winch assembly in a position in which the driven gear is in meshing engagement with the drive gear on the drive shaft, and also functions in part as a stop against which the winch assembly rests when it is pivoted to a position of non-engagement with the gear on the drive shaft.

3,724,684

BALE RELOCATOR MECHANISM FOR A BALE WAGON

Gene R. Butler, and Gary L. Sipe, both of Kingsburg, Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 22, 1971, Ser. No. 210,731
Int. Cl. B65g *57/32*
U.S. Cl. 214—6 B **20 Claims**



A bale relocator mechanism for engaging and repositioning selected bales on a bale wagon. The bale relocator mechanism of the present invention is disclosed in the form of two species, each species being adapted for employment within a bale wagon having a first receiving table adapted to receive bales and transfer the bales received to a rearwardly disposed transfer table where the bales are accumulated into a tier, at which point the transfer table functions to transfer each tier to a rearwardly disposed load bed to form a stack of side-by-side tiers thereon.

The first species comprises a hydraulically powered finger structure pivotally mounted about a longitudinally extending axis beneath the transfer table of the bale wagon and operative to move through an opening therein for engaging and laterally repositioning an overlying bale. A fence structure is situated along one side of said transfer table in spaced apart relationship to said finger structure to limit the lateral movement of the bale being repositioned.

The second species comprises a mechanically actuated finger structure that is associated with the receiving table of the bale wagon. The finger structure of the second species is carried by a laterally extending connecting rod, the fingers of the finger structure being pivotally mounted thereon and aligned for engagement with a series of cams. The connecting rod is moved laterally, causing said fingers to contact said cams and move upwardly engaging and repositioning a bale thereover, by a bell crank engaging a trap door as said receiving table is pivoted upwardly to deposit bales thereon on said transfer table. As with the first species, a fence structure is provided along one side of said transfer table to maintain the outer ends of the bales repositioned within limits.

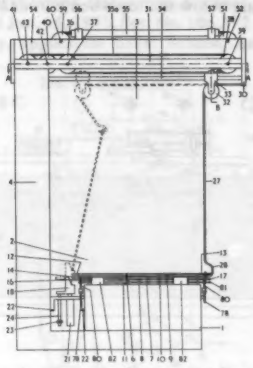
3,724,685

SHEET HANDLING

Ronald Bevan, Welwyn Garden City, Hertfordshire, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 32,154, April 27, 1970, Pat. No. 3,610,451. This application July 1, 1971, Ser. No. 158,964
Claims priority, application Great Britain, May 7, 1969, 3377/69
Int. Cl. B65g *60/00*
U.S. Cl. 214—8.5 R **6 Claims**

Apparatus and a method for dismantling and reassembling cells e.g., for press loads in which the sheets are pivoted about one side to expose workpieces which are then removed, and



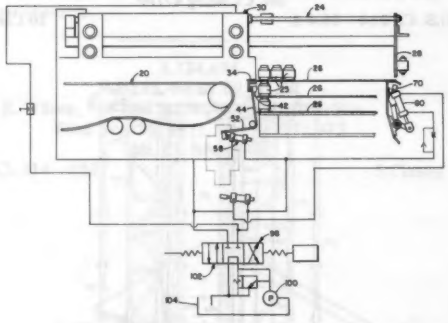
fresh workpieces are inserted in their place on lowering of the sheets.

3,724,686

GLASS JAR HANDLING SYSTEM

Lloyd A. Nelson, Fremont, Mich., assignor to Gerber Products Company, Freemont, Mich.

Filed Aug. 23, 1971, Ser. No. 173,887
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 A **14 Claims**



A system for use in depalletizing glass jars disposed in groups in a vertical stack wherein the groups of jars are successively moved laterally off the top of the stack and onto a lateral conveyor. The jars are supported on flat panels and a sensor is provided to sense the uppermost panel and to control the elevation of the stack, whereby the elevation will stop when the upper group of jars is aligned with the conveyor. Means is provided to push the jars away from alignment with the sensor so that it will engage the uppermost jar-supporting panel rather than the jars themselves. Means is also provided to push the upper panel laterally to assure that it will be in position to engage the sensor.

3,724,687

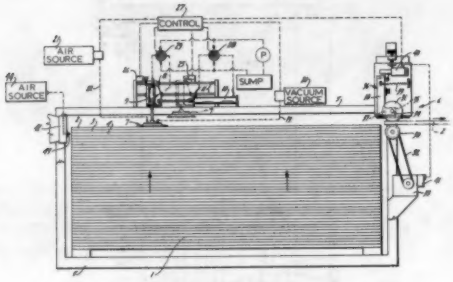
PANEL BOARD FEEDING APPARATUS

Carl R. Marschke, and Richard H. Thomas, both of Phillips, Wis., assignors to Marguip, Inc., Phillips, Wis.

Filed March 26, 1971, Ser. No. 128,359
Int. Cl. B65g *59/04*
U.S. Cl. 214—8.5 D **7 Claims**

A panel board feeding apparatus wherein a vacuum head having a convex board-engaging surface picks up the top

board in a stack, causing the board to flex convexly so that it does not stick to the next adjacent board. The head is supplied with pressurized air as well as vacuum, which breaks any residual vacuum below the top when porous boards are used,



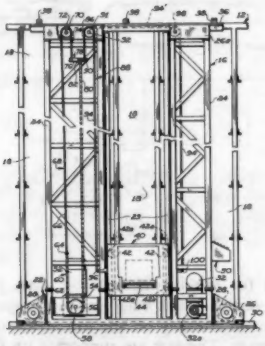
and also sets up vibrations in the stack. The head feeds a board into a nip and, if more than one board is fed, the board drive automatically reverses and kicks them rearwardly where they engage a stop with high impact. The stop also includes an air jet which impinges on the stack edges.

3,724,688

HOISTING MECHANISM FOR AUTOMATIC WAREHOUSING SYSTEM

Wayne G. Atwater, Willoughby, Ohio, assignor to The Triax Company, Cleveland, Ohio

Filed April 6, 1971, Ser. No. 131,664
Int. Cl. B65g *47/10*
U.S. Cl. 214—16.4 A **10 Claims**



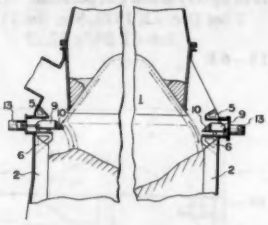
An automatic warehousing system comprising a plurality of load support cubicles for storing loads and a mechanized load carrier comprising a horizontally movable conveyor portion, a vertically movable elevator portion mounted on the conveyor portion and a laterally extensible load handling or extractor portion, mounted on the elevator portion, for inserting loads into and removing loads from selected of the storage cubicles. The lift motor for the elevator portion is mounted adjacent the lower end of the conveyor portion and is coupled to the elevator portion by flexible support means, such as, for instance, roller chain coacting with the lift motor and reeved about idler sprockets mounted on the upper end of the conveyor portion, and then extending downwardly to be anchored to the elevator portion. Automatic tensioning means coacts with the flexible support means for maintaining the flexible support means taut irrespective of the vertical position of the elevator portion with respect to the horizontally movable conveyor portion.

3,724,689

CHARGE DISTRIBUTING APPARATUS FOR BLAST FURNACES

Tsunenori Sugawara, and Jiro Mase, Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1971, Ser. No. 144,537
Claims priority, application Japan, May 22, 1970, 45/43603
Int. Cl. F27b *1/12*
U.S. Cl. 214—36 **28 Claims**



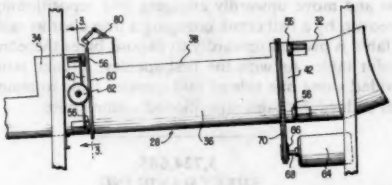
The charge distributing apparatus for blast furnaces comprises a charge distributing plate which is located below the lower bell and above the surface of the deposited charge and which is slanted at a predetermined angle, a guiding member to guide said distributing plate horizontally which is securely fixed to the blast furnace wall, and a driving system to drive said distributing plate back and forth along said guiding member. The distributing plate of the apparatus facilitates to shifting the position of charge disposal in a blast furnace, so that the surface of the deposited charge will be even.

3,724,690

UNLOADING DEVICE FOR A CAPSULE-TRANSPORT PIPELINE SYSTEM

Homer J. Bates, Roswell, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Continuation-in-part of Ser. Nos. 856,566, Sept. 10, 1969, abandoned, and Ser. No. 140,071, May 3, 1971. This application Oct. 28, 1971, Ser. No. 193,378
Int. Cl. B65g *67/50, 51/24*
U.S. Cl. 214—52 C **6 Claims**



A pipeline transportation system for vehicles in which the motive force is low pressure air traveling at a velocity substantially at which the vehicles are swept along includes an arrangement for returning the vehicles to a transfer duct and, in their return, to be stopped and dumped by inverting and then righting them.

3,724,691

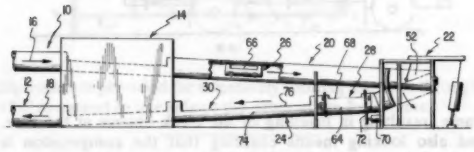
DEVICE TO STOP AND TO CHANGE DIRECTION OF VEHICLES IN A CAPSULE-TRANSPORT PIPELINE

Marion R. Carstens, Atlanta, and Homer J. Bates, Roswell, both of Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Continuation-in-part of Ser. Nos. 856,566, Sept. 10, 1969, abandoned, and Ser. No. 140,071, May 4, 1971. This application Oct. 28, 1971, Ser. No. 193,377

Int. Cl. B65g *67/50, 51/24*

U.S. Cl. 214—52 C 18 Claims



A pipeline transportation system for vehicles in which the motive force is low pressure air traveling at a velocity substantially at which the vehicles are swept along includes a first pipeline which leads to a transfer duct and a second pipeline which leads away from the transfer duct. A guiding pipeline extends beyond the transfer duct as a continuation or extension of that pipeline in which air flows into the transfer duct and an extension of the other pipeline also leads from the transfer duct, the two guide extensions having free end portions disposed in close adjacency to each other. A dead-end chamber is swingably mounted for movement between positions aligned with the respective free end portions of the two guide extensions and in the return guide extension there is an unloading station whereat the vehicle may be inverted and then righted and beyond this there is a loading station so that the vehicle can be loaded, returned to the transfer duct and then conveyed to some distant region through the other pipeline.

3,724,692

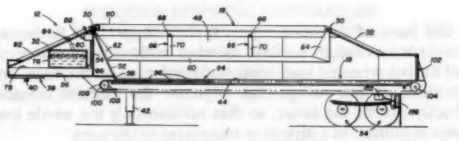
MATERIAL DELIVERY SYSTEM

John H. Holland, Norman, Okla., assignor to Arkansas Rock and Gravel Co., Murfreesboro, Ark.

Division of Ser. No. 852,345, Aug. 22, 1969, Pat. No. 3,647,096. This application Oct. 6, 1971, Ser. No. 187,161

Int. Cl. B60p *1/38*

U.S. Cl. 214—83.36 7 Claims



A delivery system for hot asphalt includes a plurality of semi-trailers. Each trailer includes a V-shaped hopper having an asphalt supporting beam extending longitudinally through it. A tube extends around the hopper for use in spraying lubricating oil into the hopper prior to the loading of asphalt. Each trailer further includes a conveyor for unloading asphalt from the hopper into a paving machine. The conveyor is driven by a hydraulic motor that is controlled by a valve. The valve is mounted in the trailer for activation by a prod mounted on the paving machine so that the operation of the conveyor is controlled from the paving machine.

3,724,693

EXCAVATING AND/OR LOADING DEVICES

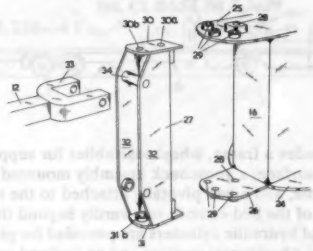
Richard Smalley, Sleaford, England, assignor to Richard Smalley (Engineering) Limited, Osbournby, Sleaford, England

Filed Jan. 14, 1971, Ser. No. 106,372

Claims priority, application Great Britain, Aug. 1, 1970, 37,259/70

Int. Cl. E02f *3/04*

U.S. Cl. 214—138 C 4 Claims



A load-moving device, particularly an excavator, having a turntable swivellable about a vertical axis and which carries a jib capable, of being pivotally raised and lowered, a load-moving appliance being mounted on the jib, the jib being pivotally mounted on a support member, which, in turn, is pivotally mounted on the turntable about a vertical axis offset from the swivel axis and is capable of being locked in a selected one of a plurality of angular positions. The jib can therefore, be positioned to extend generally tangentially of the turntable, when desired, thereby enabling the device to operate close to a wall or other obstacle.

3,724,694

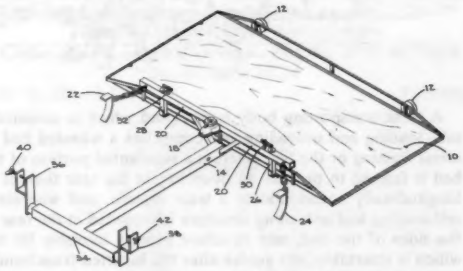
WHEEL-LESS TRAILER

Lynn E. Wilson, 724 Pine St., N., North Hudson, Wis.

Filed Aug. 30, 1971, Ser. No. 175,972

Int. Cl. B06r *9/00*

U.S. Cl. 214—450 5 Claims



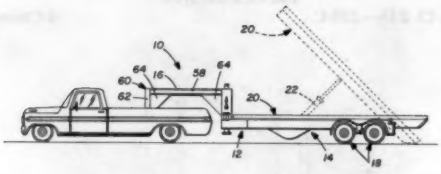
The invention relates to a load carrying attachment designed for mounting on the rear of a motor vehicle in a cantilevered fashion, supported at one point by a standard trailer hitch, preferably having ball hitch attachment and at points located underneath the vehicle preferably at opposite sides of the spring, there being a centrally pivotable load carrying platform which can be tilted to either side to permit loading and unloading of the device, there being a lateral supporting means affixed to the supporting frame and to points at opposite sides of the rear of the vehicle bumper, the opposite sides of the platform being releasably attached to the supporting means to permit tilting of the platform about the central pivot.

3,724,695

SELF-CONTAINED GOOSENECK DUMPING TRAILER

Robert S. Taylor, 2526 Cartwright, Dallas, Tex.

Filed April 21, 1971, Ser. No. 135,936
Int. Cl. B60p 1/28
U.S. Cl. 214—505 9 Claims



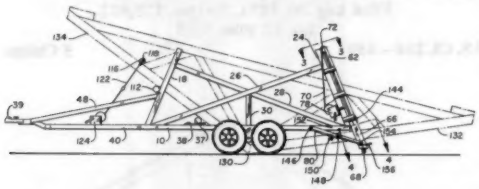
A trailer includes a frame, wheel assemblies for supporting the frame on a surface, a gooseneck assembly mounted at the front of the frame, and a bed pivotally attached to the rear of the frame. Part of the bed extends rearwardly beyond the rear of the frame, and hydraulic cylinders are provided for pivoting the bed between a horizontal position and an inclined position in which the rear of the bed engages the surface. A hydraulic winch is mounted on the frame and a cable extends from the winch first rearwardly to a pulley mounted at the rear of the frame, then forwardly to a pulley mounted at the front of the bed and finally rearwardly along the top of the bed. An engine and a hydraulic pump are mounted within the gooseneck assembly and function to supply pressurized hydraulic fluid for operating the cylinders and the winch.

3,724,696

TRUSS TRANSPORTING BODY

Charles G. Leeper, 1021 Wataguast, Kingsport, Tenn.

Filed July 1, 1971, Ser. No. 158,739
Int. Cl. B60p 1/54
U.S. Cl. 214—512 8 Claims



A truss transporting body is disclosed which is essentially self- loading and unloading and comprises a wheeled bed of metal framing or the like wherein a substantial portion of the bed is framed to provide an open bay at the rear thereof to longitudinally accommodate a truss bundle, and wherein a self-loading and unloading structure is provided at the rear of the sides of the bed, said structure being a movable lift bar which is insertable into guides after the inverted truss bundle has been tipped forward on its apex, and means are provided for elevating the lift bar, such as pulley means, to raise the truss bundle off of the ground to a transportable position.

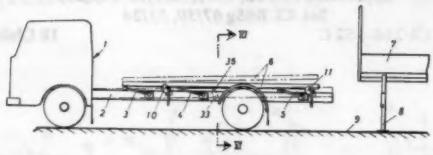
3,724,697

TRUCK HAVING A VERTICALLY DISPLACEABLE CARRYING FRAME

Carl-Eric Arvidsson, Laholm, Sweden, assignor to Lagaholm AB, Laholm, Sweden

Filed June 1, 1971, Ser. No. 148,783
Claims priority, application Sweden, June 15, 1970, 8288/70
Int. Cl. B60p 1/64
U.S. Cl. 214—515 5 Claims

An arrangement in loading trucks having a support frame which is movable relatively the truck chassis, and a detachable loading platform supported on said frame. The invention comprises traction means by means of which the support frame is connected to the truck chassis in such a way that the springs of the rear axle are compressed at the raising of the support



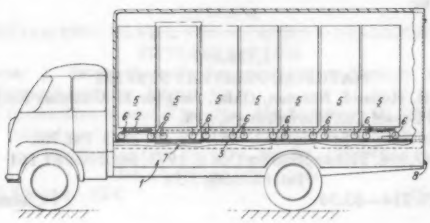
frame, resulting in levelling of the truck chassis at the rear, and also locking means ensuring that the compression is retained independently of the movements of the support frame, and means for releasing such locking when the support frame is in an upper position.

3,724,698

GOODS VEHICLES

William A. Weston, Crawford, England, assignor to N. V. Foco, Nederland, Bedum, Netherlands

Filed Oct. 12, 1970, Ser. No. 79,802
Claims priority, application Great Britain, April 27, 1967, 19,366/67; May 26, 1967, 24,498/67; Nov. 3, 1967, 50,061/67; March 27, 1968, 14,831/68. The portion of the term of this patent subsequent to Feb. 2, 1988, has been disclaimed.
Int. Cl. B60p 1/44
U.S. Cl. 214—518 12 Claims



The base of a load-carrying system supports a horizontal conveyor having an endless member with side-by-side runs, and having wheeled load receptacles running on the base, and the sides of the receptacles adjacent the endless member directly overlie the latter, so that substantially the whole load space is utilized in a direction transverse to the runs.

3,724,699

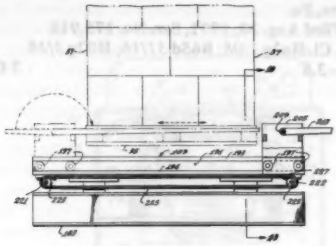
HORIZONTALLY PIVOTED FORKLIFT APPARATUS

David C. Weston, Culver City, Calif., assignor to Interstate Restaurant Supply Company, Inc., Los Angeles, Calif.

Division of Ser. No. 823,762, May 12, 1969, Pat. No. 3,606,039. This application July 30, 1971, Ser. No. 167,602
Int. Cl. B66f 9/14
U.S. Cl. 214—730 9 Claims

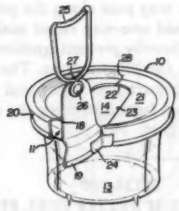
Fork lift apparatus for depositing and retrieving pallets on opposite sides of a narrow aisle and including a fork frame carried on support means movable longitudinally in the aisle and formed with transversely extending truck tracks. Transversely

shiftable trucks are mounted on the tracks and have one end of elongated tine means pivotably connected therewith. Fork



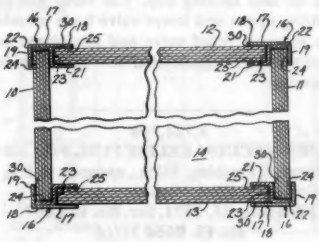
flip means is provided for selectively rotating the tines through 180° to extend to one side or the other of the fork frame.

3,724,700
CONVENIENCE OPENING CLOSURE
Vernon C. Heffran, Perrysburg, Ohio, assignor to Owens-Illinois Inc., Toledo, Ohio
Filed Feb. 22, 1971, Ser. No. 117,426
Int. Cl. B65d *43/02*
U.S. Cl. 215—46 A **10 Claims**



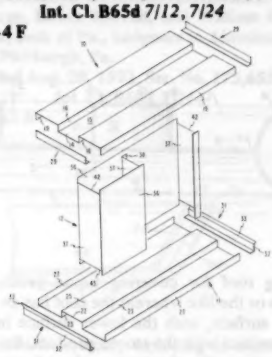
The invention disclosed is related to scored tear strips in convenience type ("Easy-open") bottle closures. To prevent complete tear out of the tear strip on removal of the cap, the present invention halts the tearing of one of the side scores so that the closure and tear strip remain in one piece and are removable from the container as a unit. In the path of one of the legs of the tear strip is an obstruction, i.e., a folded tab integral with the skirt, which stops the tearing action in the one leg while the other opposite leg continues to tear through the edge of the skirt.

3,724,701
WOODEN SHIPPING CONTAINERS
August G. Barkow, 2230 South 43rd Street, Milwaukee, Wis.
Filed Oct. 2, 1970, Ser. No. 77,665
Int. Cl. B65d *9/34*
U.S. Cl. 217—65 **1 Claim**



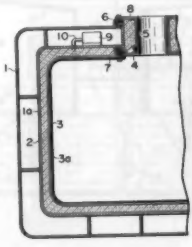
A wooden shipping container has the edges of its walls adhesively secured in channels formed in metal corner pieces, each corner piece extending substantially the length of the edges received therein and presenting a pair of channels which face at an angle to one another, at least one of said channels having a reinforced base in certain embodiments.

3,724,702
EQUIPMENT ENCLOSURE
Robert C. Kay, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed March 2, 1971, Ser. No. 120,238
Int. Cl. B65d *7/12, 7/24*
U.S. Cl. 220—4 F **6 Claims**



This invention provides an enclosure in which the principle structural support is provided by a pair of generally horizontal sheet metal planes separated by a central column with each of the members being formed of a continuous piece of sheet metal. The central column cooperates with the top and bottom structural members, not only to support, but to provide alignment and gauging functions and may further simultaneously provide for shielding, compartmentalization and ducting functions. The enclosure is completed by top and side covers supported from the principle structural elements.

3,724,703
LOW TEMPERATURE LIQUEFIED GAS STORAGE TANK AND TANKER
Katsuro Yamamoto, Tokyo, Japan, assignor to Bridestone Liquefied Gas Company Limited, Tokyo, Japan
Filed Oct. 28, 1971, Ser. No. 193,344
Claims priority, application Japan, Oct. 31, 1970, 45/95630
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 LG **9 Claims**



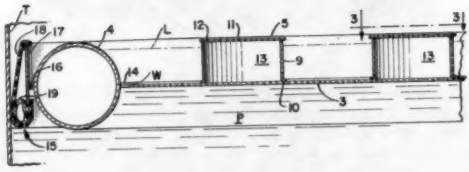
A storage container constructed either as a tank or a tanker for storage of low-temperature liquids such as liquefied gases. The container is constructed as an outer vessel with a thermal insulation lining and an inner membrane structure consisting of two thin metallic membrane tanks one interiorly of the other. The innermost tank or vessel is thinner than the other inner tank and maintains the fluid-tightness of the container. A vacuum pump applies a vacuum to the space between the two inner tanks to detect leaks and maintains the innermost vessel from collapsing in a non-loaded condition.

3,724,704

FLOATING ROOF HAVING UNIFORMLY DISTRIBUTED BUOYANCY MEANS

Norman W. Edwards, Sewickley; Vincent H. Derr, Coraopolis, and Richard A. Mattson, Sewickley, all of Pa., assignors to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.

Filed April 13, 1971, Ser. No. 133,557
Int. Cl. B65d 87/18
U.S. Cl. 220—26 R 25 Claims



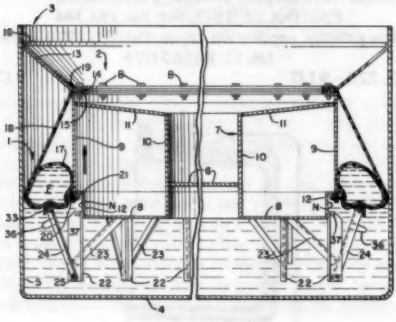
A Floating roof for covering liquid products stored in storage tanks or the like wherein the roof has an upper surface and a lower surface, with the lower surface in substantially continuous contact with the stored product. Buoyancy means are connected to the floating roof and are substantially uniformly distributed with respect thereto to float the roof on the stored product in the event the stored product leaks onto the surface of the floating roof, and to prevent sinking thereof beyond a predetermined amount and to minimize uneven settling of the roof in the stored product.

3,724,705

EXPANDING TUBE SEAL FOR FLOATING ROOF STRUCTURES

Dean K. McKibbin, Warren, Pa., assignor to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.

Filed May 4, 1971, Ser. No. 140,055
Int. Cl. B65d 87/18
U.S. Cl. 220—26 R 25 Claims



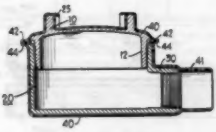
An expanding tube seal for floating roof structures wherein a tube is enclosed within and protected by a scuff band supporting the tube from the roof structure, said expanding tube seal being capable of sealing the rim space between the floating roof structure and the wall of a storage tank or the like within predetermined limits of maximum and minimum rim spaces, and mechanical means engaging with the undersurface of said tube seal to prevent excessive sag of said tube and thereby increase the horizontal reach of said tube seal.

3,724,706

EXPLOSION PROOF JUNCTION BOX

Fred H. Slocum, Pittsburgh, Pa., assignor to Robroy Industries, Verona, Pa.

Filed Aug. 30, 1971, Ser. No. 175,916
Int. Cl. Ho2g 3/08; B65d 51/16; H02g 3/18
U.S. Cl. 220—3.8 7 Claims



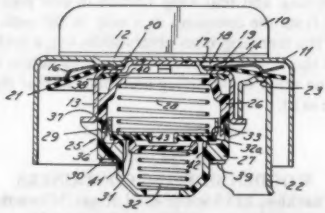
An explosion-proof and corrosion resistant junction box for electrical connection junctures and the like including a cap portion having a downwardly extending external screw portion, and a body portion having an internal screw portion. Both cap and body portions have a resilient, moisture resistant, polymeric coating bonded to the metal substrate. The cap and base portion coatings terminate in downward and upwardly extending relatively flexible flanges around their respective peripheries. The respective coated portions are adapted to threadably engage whereby the flange portions come into contact to provide an effective one-way vapor seal, and whereby the screw portions provide a path for gases from within to without the junction box. Hot gases under pressure within the junction box may pass along the path in said screw portions and through said one-way vapor seal, and, in so doing, become cooled to thereby prevent ignition or explosion of atmospheric gases near the junction box. The flange portions provide an effective moisture and vapor seal whereby corrosive vapors are prevented from corroding the outside surfaces or entering the junction box.

3,724,707

PRESSURE-VACUUM RELIEF FUEL FILLER CAP

Ronald R. Burgess, Flushing, Mich., assignor to F & E Manufacturing Company, Flint, Mich.

Filed May 5, 1971, Ser. No. 140,422
Int. Cl. B65d 51/16
U.S. Cl. 220—44 R 11 Claims



A pressure-vacuum relief fuel filler cap assembly comprising a cover, a locking cup fixed to said cover, and a valve assembly fixed on said locking cup. The valve assembly comprises interfitting upper and lower valve body members made of plastic. A pressure relief valve and associated seat and a vacuum relief valve and associated seat are provided within the valve assembly.

3,724,708

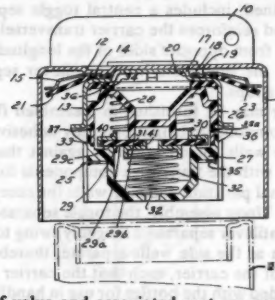
PRESSURE-VACUUM RELIEF FUEL FILLER CAP

Ronald R. Burgess, Flushing, Mich., assignor to F & E Manufacturing Company, Flint, Mich.

Filed Aug. 25, 1971, Ser. No. 174,667
Int. Cl. B65d 51/16
U.S. Cl. 220—44 R 12 Claims

A pressure-vacuum relief fuel filler cap assembly comprising a cover, a locking cup fixed to said cover, and a valve as-

sembly fixed on said locking cup. The valve assembly comprises interfitting upper and lower valve body members made of plastic. A pressure relief valve and associated seat and a



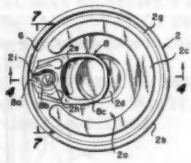
vacuum relief valve and associated seat are provided within the valve assembly. The pressure relief valve and vacuum relief valve include a common valve member.

3,724,709

PULL TAB ARRANGEMENT FOR AN EASY OPEN END

Teddy M. Westphal, Chesterfield, Mo., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 19, 1972, Ser. No. 219,013
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **5 Claims**



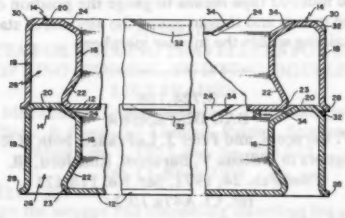
An improved pull tab arrangement for an easy open end closure member, characterized by the provision of improved pull tab positioning means for positively maintaining the pull tab in a desired orientation relative to the panel-defining scoreline not only during the initial opening period when the pull tab is listed to effect rupturing of the scoreline, but also during the subsequent opening period when a pulling force is applied to the pull tab to tear the removable panel from the end member along the scoreline. To this end, the retaining means are arranged solely between the free extremity of the pull tab nose portion and the rivet means that secures the tab to the end closure member.

3,724,710

CONTAINER LID

Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics Inc., Wilmington, Md.

Filed Nov. 5, 1970, Ser. No. 87,090
Int. Cl. B65d *43/10, 21/00*
U.S. Cl. 220—60 R **2 Claims**



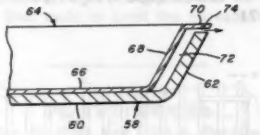
A plastic container lid is adapted for use in high speed automated packing techniques in which a number of lids are loaded in stacked configuration and are drawn from the bottom of the stack in succession to cap successively presented containers. The region of each lid which engages the next uppermost adjacent lid in the stack is provided with specially formed surfaces to communicate the region between the stacked lids with the atmosphere. This avoids any tendency for a plurality of lids to stick together when drawn from the stack.

3,724,711

COOKING UTENSIL ASSEMBLY

Daniel J. George, Lower Burrell, and William C. Patterson, Turtle Creek, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 20, 1971, Ser. No. 173,655
Int. Cl. B65d *25/14*
U.S. Cl. 220—63 R **8 Claims**



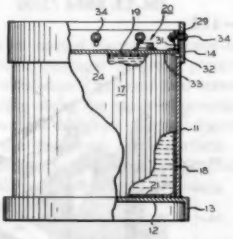
A cooking utensil assembly including an outer metal container having a continuous base portion and a continuous generally upwardly directed annular sidewall. An inner metal container secured within the outer container and having a continuous bottom wall and a generally upwardly directed annular lateral wall. At least one venting passageway defined between an outwardly open venting channel positioned in the inner container lateral wall and the adjacent portion of the outer container sidewall. Venting conduits may be provided between radially disposed downwardly open venting channels in the inner container bottom wall and the underlying adjacent outer container base portion.

3,724,712

CONTAINER FOR BULK SHIPMENT OF CORROSIVE LIQUIDS OR THE LIKE

Anthony J. Starr, and Gerald D. Spence, both of Wilmington, Del., assignors to Container Corporation of America, Chicago, Ill.

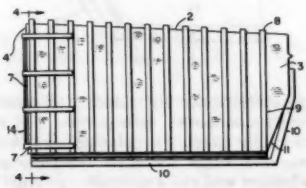
Filed Feb. 19, 1971, Ser. No. 117,007
Int. Cl. B65d *25/14*
U.S. Cl. 220—63 R **3 Claims**



A container for bulk shipment is comprised of an outer rigid shell with an inner flexible hollow container liner resistant to most corrosive liquids. The liner is composed of a plastomer such as low density polyethylene or other thermoplastic having the property of cold flow when loaded, as well as compressibility under loads. The liner is provided with a filler neck and closure, and when empty it somewhat loosely fills the shell. As the liner is loaded it conforms to the inside of the shell both by elastic and plastic deformation. The top of the shell is provided with a plurality of apertures having a plurality of fasten-

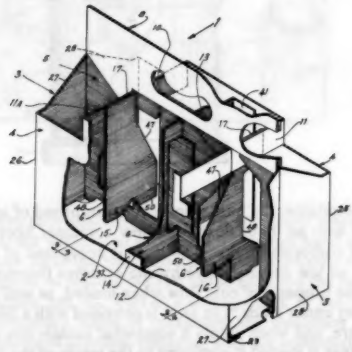
ing elements extending therethrough in fastening engagement with a locking member disposed atop a shell closure resting on the loaded elastomer liner. The locking member has apertures aligned with the apertures in the shell, and the fastening members extend through both sets of apertures. One set of such apertures is elongated to provide for movement of the shell closure with the liner before the fastening means is secured. The shell closure is provided with structure for securing the same to the filler neck of the container liner, so that the liner and the shell closure may move together within the outer shell as the container liner is filled. After filling, the shell closure is secured to the locking member by the fastening elements to make a rigid structure with the filled liner secured in place.

3,724,713
MATERIAL DISPOSAL ASSEMBLY
Harry Coren, 1444 McKinley Street, Philadelphia, Pa.
Filed Aug. 31, 1970, Ser. No. 68,430
Int. Cl. B65d *7/44, 87/24*
U.S. Cl. 220—71 **3 Claims**



A material disposal assembly to store compacted material in a high density, easily transportable system. The assembly forms a totally enclosed chamber with provision for insertion of the material. Compression of the refuse or material within the unit is aided by the declination and tapering of the enclosing walls in a longitudinal direction. Tapering of the side walls in an upward and outward direction further provides for full utilization of the enclosed chamber thereby providing a high unit density of material within the allowable chamber volume. The assembly further includes provisions for attachment to a moveable vehicle for transportation of the compacted material to a remote site.

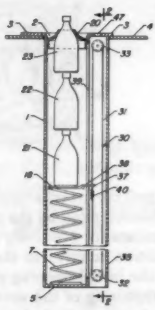
3,724,714
BEVERAGE BOTTLE CARRIER
William H. Wright, Cincinnati, Ohio, assignor to The C. W. Zumbrel Company, Cincinnati, Ohio
Filed April 28, 1971, Ser. No. 138,050
Int. Cl. B65d *75/00*
U.S. Cl. 220—113 **7 Claims**



A bottle carrier formed from a one-piece paperboard sheet blank in which the bottles are segregated and confined in individual cells to prevent them from contacting one another during transport and handling. The carrier, in general, comprises an open container having a longitudinal centralized partition, rising from its bottom and including an upstanding hand grip portion. The carrier body or container, in which the bottles are confined, includes a central toggle separator which subdivides and reinforces the carrier transversely. Transverse straps extend from opposite sides of the longitudinal partition outwardly to the side walls, with cantilever separators connected to the straps.

The carrier may be furnished in assembled flat condition, the several components being joined by adhesive or the like, with the side walls folded inwardly against the longitudinal partition and with the transverse components folded between the longitudinal partition and side walls for compactness during shipment. Upon assembly, the toggle separator, transverse straps and cantilever separators hingedly swing to the right angular position as the side walls separate, thereby completing the erection of the carrier, such that the carrier is in a condition to be loaded with the bottles for use in handling and transport.

3,724,715
DISPENSER WITH METERING SYSTEM
Nicholas A. Auriemma, Miami, Fla., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Sept. 24, 1970, Ser. No. 75,016
Int. Cl. B65g *1/16*
U.S. Cl. 221—4 **3 Claims**

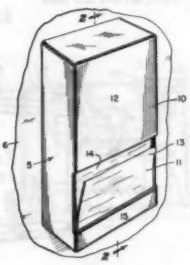


A dispenser for storing and dispensing a plurality of stacked articles having a metering system for determining the amount of articles remaining within the dispenser. The dispenser includes a tubular member having an open end and a spring means which urges the articles through the open end. A stopping means temporarily prevents the articles from passing through the open end and permits the removal of the uppermost article. A movable indexed tape means connects to the movable end portion of the spring means, its movement being in direct relationship to the movement of the end portion of the spring means. A reference means is located adjacent a portion of the indexed tape means to gauge the position of the indexed tape means and thus to gauge the amount of stacked articles remaining within the tubular member.

3,724,716
BAG DISPENSER
William V. Baraconi, and Peter J. LaFranca, both of Rockford, Ill., assignors to William V. Baraconi, Rockford, Ill.
Filed Feb. 24, 1971, Ser. No. 118,421
Int. Cl. A47k *10/24*
U.S. Cl. 221—47 **2 Claims**

The generally rectangular case, in which the folded bags are placed with their folded bottom portions exposed in a

generally rectangular opening in the lower portion of the front wall of the case, is detachably secured to a back plate that is fastened to the wall or any other suitable support. The back plate fits inside the open back of the case and has a lug at one end entered in a slot in the abutting end wall of the case, while



a wedge shaped catch projection on the other end wall of the case is engaged over the adjacent end of the back plate, the connections at both ends being held intact under light balanced spring pressure by virtue of the inwardly arched end walls of the case bearing against the opposite ends of the back plate when the case is assembled thereon.

3,724,717

ARTICLE DISPENSING WHICH ARRANGES ARTICLES SO THAT SEVERAL MAY BE VIEWED AT ONE TIME FOR SIMULTANEOUS APPROVAL OF THE OPERATOR

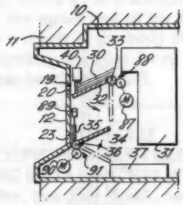
Hideyuki Goto, Osaka, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 14, 1971, Ser. No. 143,491

Claims priority, application Japan, May 27, 1970, 45/45817

Int. Cl. G07f 7/02

U.S. Cl. 221—155 **13 Claims**



Apparatus for dispensing articles such as bills or envelopes containing money or other articles, wherein the articles to be dispensed are temporarily positioned inside a window formed in the front panel of the apparatus so that they can be looked at and checked from outside for confirmation by the user of the apparatus before they are dispensed.

3,724,718

DEVICES FOR HOLDING TRAVELLERS FOR USE ON RINGS OF RING SPINNING, TWISTING, DOUBLING AND LIKE FRAMES

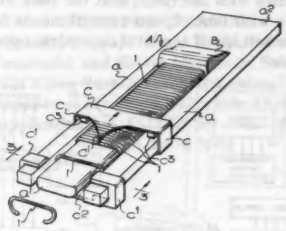
William MacArthur Gillies, Glasgow, Scotland, assignor to Eadie Bros. & Company Limited, Paisley, Scotland

Filed Feb. 7, 1972, Ser. No. 223,943

Int. Cl. B65h 3/00

U.S. Cl. 221—267 **3 Claims**

A device for storage and dispensing travellers for use on the rings of ring spinning, twisting and doubling frames comprises and E shaped frame having two outer legs and a central leg to receive the travellers, a yieldable pointer and pointer body of channel shape slidably mounted on the outer legs to dispense travellers one at a time as the pointer is moved over the travel-



lers or as the travellers are pushed under the pointer by a push slide channel shaped stops being provided on the outer legs adjacent their free ends to limit the movement of the slide body.

3,724,719

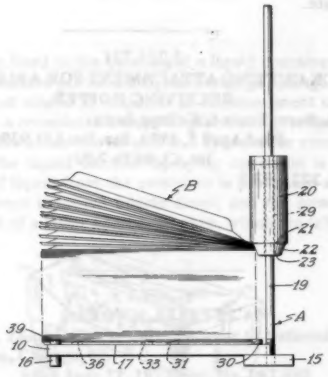
PLATE DISPENSER

Joseph P. Engler, St. Paul, and Glen E. Paulsen, Minneapolis, both of Minn., assignors to T. O. Plastics, Inc., Minneapolis, Minn.

Filed Feb. 16, 1971, Ser. No. 115,243

Int. Cl. A47f 1/06

U.S. Cl. 221—279 **10 Claims**



A plate dispenser for nested stacked concave-convex plates acts to position the uppermost inverted plates in position where they can be individually grapsed and removed. A standard extends upwardly along the stack of inverted plates and slidably supports a weight designed to apply downward and inward pressure to the periphery of the stack, causing the diametrically opposed areas of the uppermost plates to fan out so as to be accessible for removal from the stack.

3,724,720

DIGITAL MASS FLOW CONTROL SYSTEM

Kenneth W. Bullivant, Glassboro, N.J., assignor to K-Tron Corporation, Glassboro, N.J.

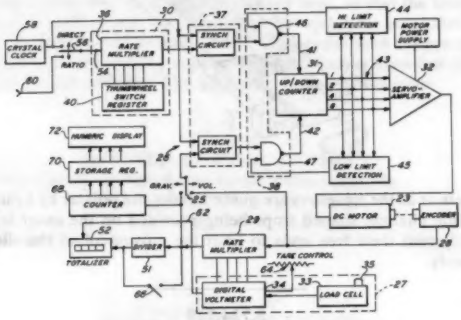
Filed Aug. 5, 1971, Ser. No. 169,398

Int. Cl. G01g 11/12

U.S. Cl. 222—55 **25 Claims**

The throughput of a conveyor belt is controlled by a motor whose speed is established by the instantaneous state of an up/down counter. The counter is incremented upwardly by setpoint pulses representative of the desired mass flow rate,

and downwardly by feedback pulses from a rate multiplier representative of the actual mass flow rate. When the actual mass flow rate is equal to the setpoint flow rate, the average number of setpoint pulses will equal the average number of feedback pulses with the result that the state of the counter will be stable with time. Speed control means for the motor maintains the belt speed at a level dependent upon the state of



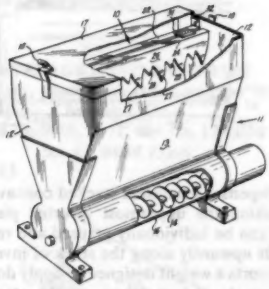
the counter. A variation between the actual and desired mass flow rates is manifested by a change in the average number of feedback pulses which results in a change in the state of the counter. The resultant change in the motor speed and hence the belt speed restores the average number of feedback pulses to equality with the setpoint pulses thus restoring stability to the counter and restoring the actual mass flow rate to the setpoint rate.

3,724,721

SACK CUTTING ATTACHMENT FOR A MATERIAL RECEIVING HOPPER

Floyd A. Barr, Route 1, Kellogg, Iowa

Filed April 7, 1971, Ser. No. 131,939
Int. Cl. B67b 7/28
U.S. Cl. 222—83.5 **1 Claim**



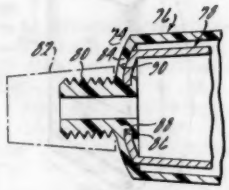
The attachment comprises a cutting member formed along one side with a series of alternately arranged large and small teeth or serrations. The apex portions of adjacent large teeth are inclined upwardly and outwardly in opposite directions laterally of the cutting member. With the cutting member supported between opposite side walls of a hopper and the serrations projected upwardly from the hopper, a sack, with the transverse dimension thereof extended longitudinally of the cutting member is dropped onto the cutting member, whereby the underside of the sack is cut transversely. The opposite ends of the sack are then manually grasped and moved upwardly and inwardly toward each other to empty the contents thereof into the hopper.

3,724,722

CONTAINER CONSTRUCTION

Frank Ballo, 12442 Sidonie, Warren, Mich.

Filed June 3, 1971, Ser. No. 149,547
Int. Cl. B65d 35/56
U.S. Cl. 222—105 **2 Claims**



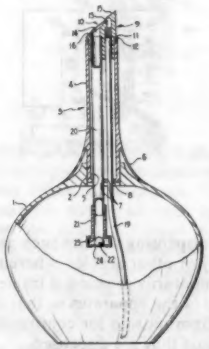
A container for toothpaste and other substances having a permanently deformable inside dispenser for containing the substance, a resiliently deformable surrounding housing which protects the dispenser, a nozzle on the dispenser or the housing which is adapted to mate with a cap, and a portion on each of the housing and the dispenser which is securely engaged with the other portion for positively restraining relative motion between the housing and dispenser independently of the cap.

3,724,723

SPRAY DEVICES FOR HAIR LACQUER

Antony Slavinski, 5 Avondale Drive, Holcombe Brook, Bury, England

Filed July 24, 1970, Ser. No. 58,073
Int. Cl. B67d 1/16
U.S. Cl. 222—110 **1 Claim**

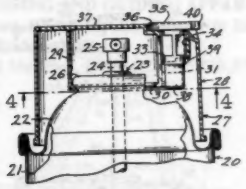


A squeeze bottle for lacquer includes a spray head having an upper sloping face, stepped to form a vertical shoulder, and a generally horizontally directed air and liquid spray outlet in the shoulder, connected to a dip tube which is free of valves. A combined air and liquid drip inlet recess is located in the sloped face below the horizontal outlet and in the path of drippings therefrom, there being a separate drip tube connecting the same to a one way valve located centrally of the bottle. Pressure closes the valve and suction opens it to draw drippings back into the container.

3,724,724
TAMPERPROOF AND CHILDPROOF OVERCAP FOR AN AEROSOL CAN

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Jan. 27, 1972, Ser. No. 221,292
Int. Cl. B67b 5/00
U.S. Cl. 222—153 6 Claims

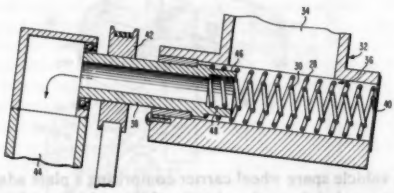


A substantially tamperproof and childproof replaceable overcap for an aerosol spray can or the like which has a central dispensing valve at one end with an annular collar surrounding the dispensing valve. The cap is molded from a resilient material and has an inverted, cup-shaped, outer wall and an inner concentric skirt. The inner skirt is vertically slotted and has an inwardly turned retaining lip at its lower edge. The resiliency of the skirt biases the lip inwardly to engage beneath the collar of the can in order to retain the cap in place. A locking element which is manually rotatable between "Open" and "Locked" positions is mounted in an opening in the cap and extends downwardly between the cap wall and inner skirt to a position adjacent the lower end of the inner skirt. Engagement lugs are located on the outer side of the skirt at opposite sides of the slot in the skirt and near the bottom of the skirt. The lower end of the locking element extends between the engagement lugs on the skirt and is so shaped that rotation of the element to "Open" spreads the lower end of the skirt to reduce the degree of engagement of the retaining lip beneath the can collar so the cap can be removed. The upper end of the locking element extends upwardly through the top of the cap where it has a manually engageable head. A frangible tab on the upper end of the locking element is initially engaged in a recess in the body of the cap and prevents rotation of the locking element from "Locked" to "Open" position until it has been broken off.

3,724,725
ELECTROSCOPIC POWDER FEEDING APPARATUS UTILIZING ROTATING HELICAL MEMBERS

Russell A. Stauffer, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed March 30, 1971, Ser. No. 129,432
Int. Cl. B67d 23/00
U.S. Cl. 222—240 11 Claims

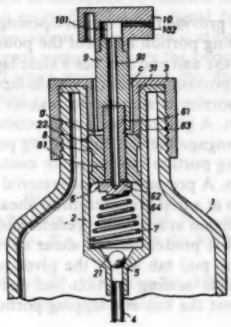


The toner feed apparatus comprises two oppositely wound spring members which are concentrically mounted. The spring members are driven so that the pitch of the outside spring conveys the toner toward a perforated end plate which feeds toner into the developer system. The inside spring is wound in the opposite direction so that contaminating material which does not pass through the perforated end plate is conveyed back and out of the toner feed apparatus for collection.

3,724,726
PUMP FOR SPRAYING

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Narashino; Shinichi Araki, Funabashi, and Shinzo Miyamoto, Soka, all of Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 12,825, Feb. 19, 1970. This application Jan. 5, 1972, Ser. No. 215,634
Int. Cl. B67d 5/40
U.S. Cl. 222—385 2 Claims

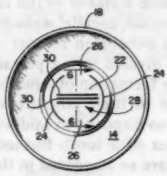


A pump fixed to the opening of a liquid container in which both of a suction port and a liquid discharge passage are firmly opened and closed in response to the movement of a piston which has a considerable axial length so as not to deform itself upon its downward movement in a cylinder for exerting pressure on the liquid therein. Spraying operation is effective; leakage of liquid from the container is prevented even when the container is turned upside down; and the pump may be comprised of a lesser number of parts, which are fabricated at less costs.

3,724,727
AEROSOL SAFETY CAN

Arthur P. Zundel, Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed June 12, 1972, Ser. No. 262,050
Int. Cl. B65d 83/14
U.S. Cl. 222—397 8 Claims



This invention relates to a safety vent for pressurized containers in which a distinctive pattern of weakened lines forms a vent means for the controlled release of pressurized fluid from a container which is subject to pressure above a predetermined safe limit such as by over heating or crushing.

3,724,728
CAN END WITH BONDED SEAL SLIDE

Donald L. Douty, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

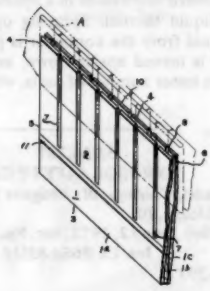
Division of Ser. No. 146,945, May 26, 1971, which is a division of Ser. No. 61,384, Aug. 5, 1970, Pat. No. 3,622,055. This application Jan. 31, 1972, Ser. No. 222,070
Int. Cl. B65d *47/10*
U.S. Cl. 222—541 22 Claims

A can end is provided with a pour opening. The can end has a can end lapping portion adjacent the pour opening. A slide has a pivot on the can end and has a slide lapping portion and a slide sealing portion adjacent the slide lapping portion. The slide lapping portion is adapted to register with the can end lapping portion. A pull tab has a connection to the slide. Engaging means engage the can end lapping portion to press the can end lapping portion into intimate contact with the slide lapping portion. A pressure barrier material seals the can end lapping portion at a first predetermined shear strength and the slide sealing portion at a second predetermined shear strength less than the first predetermined shear strength. The slide is rotatable by the pull tab about the pivot to break the bond between the slide sealing portion and the pressure barrier material adjacent the can end lapping portion to uncover the pour opening.

3,724,729
DEVICE FOR FORMING BOX PLEATS

Kenneth O. Sitts, 23129 Grove St., St. Clair Shores, Mich.

Filed May 15, 1972, Ser. No. 253,559
Int. Cl. A41h *43/00*; D06j *1/00*
U.S. Cl. 223—35 2 Claims

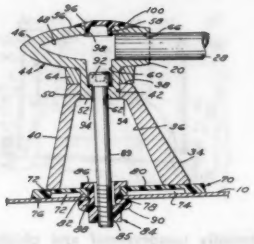


An elongated base member of flat material, such as plastic, formed to have spaced, parallel webs extending from said base member and of a dimension thinner than the base member. Each said web is divided into a plurality of teeth of uniform dimensions by the formation of equally spaced slots extending through the webs to their juncture with the base member. Each such slot is so disposed in said web, as to open upon the longitudinal center of a tooth formed in the opposing web. That is, the slots are so staggered in the respective webs as to create teeth having a staggered relationship to the opposite teeth of said respective webs. Cloth or other sheet material to be pleated is drawn or positioned between the opposed webs, and drawn or "threaded" inwardly and outwardly through the slots forming said teeth, whereby said sheet material encases each tooth to a predetermined length thereof, and after such sheet material has been predisposed as desired, a stitch or seam is made parallel to the ends of said teeth to fix the pleat as formed.

3,724,730
CAR TOP LUGGAGE CARRIER

Harry C. Olsen, Farmington; Ludwig J. Tischler, Huntington Woods, and Heinz C. Wernecke, Southfield, all of Mich., assignors to F. L. Jacobs Co., Southfield, Mich.

Filed June 23, 1971, Ser. No. 155,734
Int. Cl. B60n *9/00*
U.S. Cl. 224—42.1 D 13 Claims

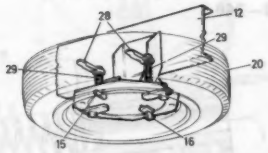


The vehicle top carrier comprises two pairs of rail support assemblies which are mounted at the corners of an imaginary rectangle on the roof of the vehicle. Each support assembly comprises a hollow post including a top wall having an opening therein. A generally hollow closure element or rail fitting is mounted on the post and is provided with a stem which extends into the opening in the top wall. The closure element is provided with one or more openings each defining a collar. Each collar of a support assembly is spaced from and is located opposite a collar of an adjacent support assembly. A resilient adapter base engages the bottom surface of the post and is adapted to engage and to conform to the shape of the roof of the vehicle. Fastening means extend through the hollow closure element, post and adapter base and is secured in the roof of the vehicle. Rails extend between adjacent rail support assemblies, with the rails having opposite ends received in the collars of the closure elements. The rails and support assemblies may be arranged in a "U" shape or in a rectangular configuration on the roof of the vehicle.

3,724,731
SPARE-WHEEL CARRIERS FOR VEHICLES

Marilyn Jean Potgieter, and Maurice Stephen Potgieter, both of Randburg, Republic of South Africa, assignors to Wheel Carrier Holdings (Proprietary) Limited

Filed March 3, 1971, Ser. No. 120,622
Claims priority, application South Africa, March 4, 1970, 70/1448
Int. Cl. B62d *43/00*
U.S. Cl. 224—42.23 4 Claims



A vehicle spare wheel carrier comprising a plate adapted to be suspended from the chassis of the vehicle and provided with a fixed hook and a movable hook. The periphery of the central opening in the wheel is engaged with the fixed hook and the wheel is then pivoted about the fixed hook until the periphery of the central opening clicks into engagement with the movable hook to support the wheel from the plate. The movable hook is guided for rectilinear movement towards and away from the fixed hook to facilitate positive engagement of

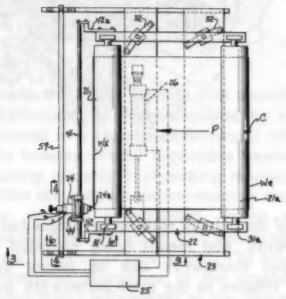
the periphery of the central opening with the movable hook. A handle is provided on the movable hook to facilitate disengagement of the movable hook with the periphery of the central opening when the wheel is to be removed from the carrier and to manipulate the movable hook in case it does not properly engage the periphery of the central opening.

3,724,732

WEB SENSING AND GUIDING APPARATUS

William A. Bonner, Rockford, Ill., assignor to Rockford Servo Corporation, Rockford, Ill.

Filed March 1, 1972, Ser. No. 230,576
Int. Cl. B65h *25/26*
U.S. Cl. 226—21 **12 Claims**



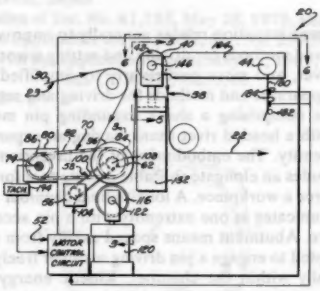
A web sensing and guiding apparatus in which a web position sensor is provided to sense the lateral position of a web as it exits from a web guide roller in an exiting plane. The sensor is mounted for movement along a crosswise guideway that moves with the exiting roller to maintain the web position sensor at a preselected spacing and attitude in relation to the exiting plane of the web, and the sensor is operatively connected to a stationary structure in a manner to maintain the sensor at a preselected location laterally of the path of web travel while accommodating movement of the sensor angularly and longitudinally relative to the path of web travel.

3,724,733

WEB INFEED MECHANISM

Robert H. Schaffer, Mystic, and James N. Crum, Stonington, both of Conn., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Feb. 3, 1972, Ser. No. 223,187
Int. Cl. B65h *23/18*
U.S. Cl. 226—25 **15 Claims**



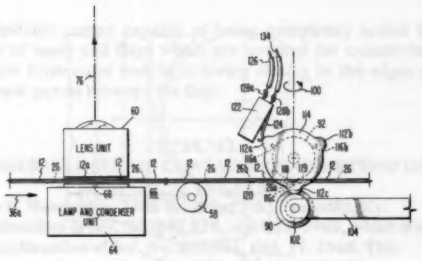
An improved web infeed mechanism feeds a web of material to receiving rolls of a printing press and includes a web drive roll which is driven from the main press driveline through a chain drive assembly and harmonic drive unit. A hollow dancer roll is pivotally mounted on a pair of support arms and is pressed with a constant pressure against a bight portion of a U-shaped loop in the web by a pair of air cylinders. Upon movement of the hollow dancer roll from an initial position, a resilient member is flexed to change the resistance of a plurality of strain gauges on the resilient member. This results in a change in an output signal from a circuit containing the strain gauges and which signal is utilized to activate control apparatus to vary the peripheral speed of the web drive roll. This control apparatus includes a reversible permanent magnet control motor which is connected by a belt drive to a wave generator in the harmonic drive unit. To provide for an accurate response at different press speeds, the control apparatus also includes a tachometer which provides a signal which is directly proportional to the speed of rotation of the receiving rolls. This signal is multiplied by the signal from the strain gauges to provide an output signal which is utilized to energize the permanent magnet motor and vary the peripheral speed of the web drive roll upon movement of the dancer roll or a change in press speed.

3,724,734

WEB TRANSPORT

Carl Lawrence Sachtleben, Haddonfield, N.J., and Erich Hans Steiner, Morrisville, Pa., assignors to RCA Corporation, New York, N.Y.

Filed March 29, 1972, Ser. No. 239,091
Int. Cl. G03b *1/28*
U.S. Cl. 226—57 **9 Claims**



A transport for film, tape, or other type of web having registration holes. The web is guided in a substantially straight path between a drive capstan and a pinch roller which normally urges the web into contact with the capstan. At least one registration pin extends radially from the capstan and is dimensioned and circumferentially positioned to freely enter registration holes in the web. When a registration pin is in a registration hole, the pinch roller is momentarily urged away from the web and the web is pulled forward, causing the trailing edge of the registration hole to engage the registration pin, whereby the web is accurately positioned. The speed of the web does not vary with respect to that of the capstan except during the short registration periods.

3,724,735

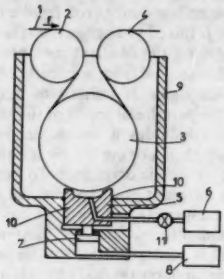
SYSTEM FOR DRIVING OR BRAKING A STRIP

Pierre Gay, La Tour-en-Jarez, France, assignor to Creusat-Loire Enterprises, Paris, France

Filed April 7, 1971, Ser. No. 131,925
Claims priority, application France, March 8, 1970, 70/6777; July 17, 1970, 7026343
Int. Cl. B65h *23/24*
U.S. Cl. 226—95 **2 Claims**

A system to apply a strip to a roller including a shoe mova-

ble radially toward the roller in the region where the strip will engage the roller, a jack to move the shoe and means to inject



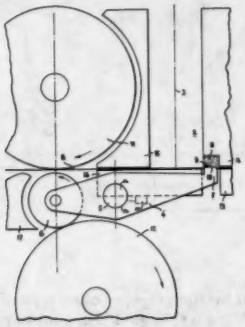
a fluid between the shoe and strip to transfer the force of the jack to the strip while keeping the shoe clear of the strip.

3,724,736

APPARATUS FOR THE RAPID, STEPWISE TRANSPORT OF A STRIP

Guy Warnez, Lucerne, Switzerland, assignor to Etablissement Microfilm Automatic Data Processing, Vanduz, Liechtenstein

Filed July 28, 1971, Ser. No. 166,708
Claims priority, application Switzerland, Aug. 4, 1970, 11768/70
Int. Cl. B65h *17/44*
U.S. Cl. 226—145 4 Claims



An apparatus for the rapid, stepwise transport of a strip, comprising a yoke carrying at one end a roller and at its other end a rapidly responsive braking element. Means are provided for controlling the tilting of the yoke, the yoke being arranged such that in one of its tilted positions it transports of feeds the strip through the action of the roller and in its other tilted position it blocks the strip owing to the action of its braking element.

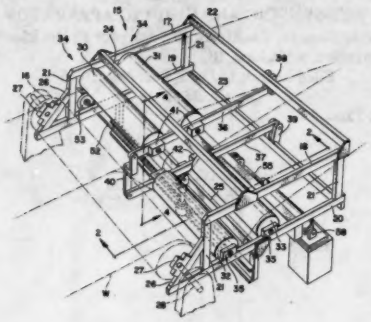
3,724,737

SPREADER FOR SLIT WEB MATERIAL

Ernest Robert Bodnar, 29 Blackdown Crescent, Islington, Ontario, Canada

Filed Oct. 6, 1971, Ser. No. 187,100
Int. Cl. B65h *23/32*
U.S. Cl. 226—199 7 Claims

A web spreader assembly having two pairs of web spreader rolls and associated with a predetermined pass line roll, by means of which the slit webs are maintained in predetermined orientation relative to the first of each of the pairs of spreader rolls, and in which the spreader rolls are mounted on a movable frame work which is swingable upwardly and downwardly so as to align the same in any desired positional relationship with relation to the rewind mandrel. The pairs of spreader rolls are preferably mounted within such a swingable framework with their outboard ends fastened to portions of the framework, and with a movable central framework, the in-



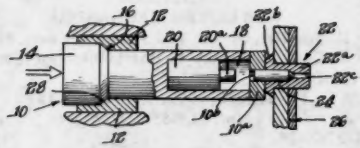
board ends of the pairs of rolls being fastened to the movable inner framework, and means being provided whereby the movable inner framework can be swung upwardly and downwardly relative to the main framework so as to swing such pairs of rolls into any desired angular relationship relative to the plane of the web.

3,724,738

RIVET SETTING APPARATUS

Thomas P. Hurst, Wayne, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 19, 1970, Ser. No. 65,206
Int. Cl. B25c *7/00*
U.S. Cl. 227—147 5 Claims



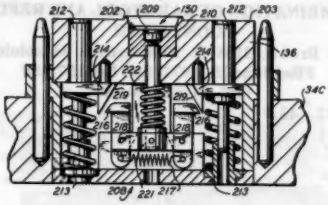
The present invention relates generally to improvements in apparatus and methods for driving and setting a work piercing fastener rivet, and more particularly to simplified and very practical apparatus and methods for driving and setting rivets of the type comprising a shank expanding pin member associated with a headed rivet shank having an expandable entering extremity. The embodiment of the invention disclosed herein includes an elongate shiftable driving tool for causing a rivet to pierce a workpiece. A longitudinal chamber within the tool communicates at one extremity with a pin accommodating aperture. Abutment means spaced axially from said aperture is adapted to engage a pin driving member freely shiftable longitudinally within the chamber. Kinetic energy resulting from sudden interruption of the driving movement of the tool upon complete insertion of the rivet member within the workpiece serves to cause the rivet expanding pin to move forwardly and expand the entering extremity of the rivet member.

3,724,739

APPARATUS FOR FREQUENCY ADJUSTING AND ASSEMBLING MONOLITHIC CRYSTAL FILTERS

Albin R. Anderson, Lowell; John D. Jennings, Andover, and Walter E. Killerby, Lowell, all of Mass., assignors to Western Electric Company, New York, N.Y.

Division of Ser. No. 80,093, Oct. 12, 1970, Pat. No. 3,696,986.
This application June 15, 1972, Ser. No. 263,077
Int. Cl. B23k *21/00*
U.S. Cl. 228—3 6 Claims



Sealed piezoelectric crystal devices with desired frequency response characteristics are manufactured by treating and sealing each crystal in a vacuum environment within a common apparatus housing. Vapor deposition treatment is utilized, with treating material replenishing mechanisms being positioned within the vacuum environment in order to avoid disturbing the vacuum environment during replenishing operations. Sealing is performed by cold weld sealing a pair of covers about each treated crystal device. The arrangement is designed to minimize alterations in the crystal frequency response characteristics subsequent to the vapor deposition treatment.

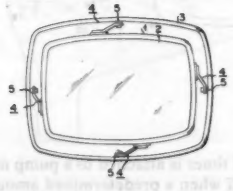
A die stripping device for ejecting each sealed article from two article-forming, cold weld sealing dies is incorporated entirely into the dies. An ejector on a bottom die is activated during sealing by an actuator of a top die. Ejection of the article from the bottom die then occurs upon die separation. The apparatus also includes a pair of turntables which overlap peripherally at a sealing station within the housing. A loading and unloading station, for introducing top covers and crystals into upper sealing dies and removing sealed crystal filter assemblies from the apparatus, and a vapor deposition crystal treating station are arrayed about one turntable. Manual and automatic loading stations for loading bottom covers into lower sealing dies are arrayed about the other turntable. Also included in the apparatus are various loading and unloading mechanisms and associated air-lock arrangements at the different stations.

3,724,740

ASSEMBLING DEVICE

Hitoshi Imamura, Kanagawa, and Keiji Katakura, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Continuation of Ser. No. 41,185, May 28, 1970, abandoned.
This application May 5, 1972, Ser. No. 250,507
Claims priority, application Japan, May 31, 1969, 44/42060
Int. Cl. B23k *1/00, 5/00*
U.S. Cl. 228—6 10 Claims



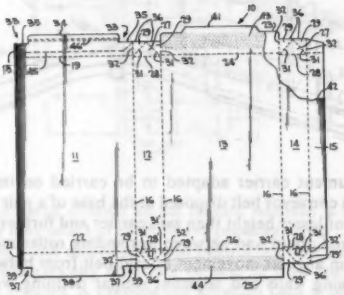
A device for accurately fixing an elastic support member having a certain length to a base body which comprises means for causing one end of an elastic support member to contact the base body, means for contracting the other end of the elastic member under pressure toward the base body without allowing the other end thereof to contact the base body and means for fixing that part of the elastic member which contacts the base body, whereby the elastic member is accurately bonded to the base body in the position for said base body to be attached to another base body by means of the elastic support member.

3,724,741

SEALABLE CARTON

Leonard P. Jacobson, North Tonawanda, N.Y., assignor to F. N. Burt Company, Inc., Buffalo, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,408
Int. Cl. B65d *5/08*
U.S. Cl. 229—38 6 Claims



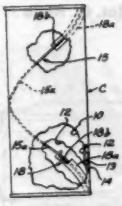
A foldable carton capable of being completely sealed by means of inner end flaps which are notched for transferring adhesive from outer end flaps during closing to the edges of fold-back panels between the flaps.

3,724,742

PRESSURIZED DOUGH CONTAINER AND METHOD OF OPENING THE SAME

James R. Henderson, 2408 Branning Rd., Louisville, Ky.

Continuation of Ser. No. 818,020, April 21, 1969, which is a continuation of Ser. No. 585,801, Oct. 11, 1966. This application Nov. 26, 1971, Ser. No. 202,182
Int. Cl. B65d *5/54, 17/00*
U.S. Cl. 229—51 BP 5 Claims



This disclosure embodies a generally cylindrical container having a body wall formed from spirally wound laminated material constructed to hold pressurized dough products such as pre-leavened dough and the like wherein the spirally formed laminations are permanently adhered together in a manner to provide sufficient body wall stiffness to rupture along a pre-determined spiral rupture line upon application of only a moderate indenting force against the body wall, the spiral rupture line in the specific embodiment disclosed being positively reinforced with the edges thereof connected to pro-

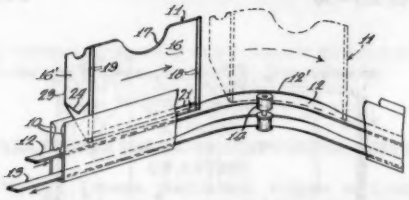
vide spaced apart circumferentially continuous sections only at the end portions of the container, the unreinforced spiral line of weakness between said reinforced end portions forming the rupture line along which the pressurized dough package can be ruptured by applying only moderate indenting force against a portion of said weakness line without peeling off any portion of any of the laminations.

3,724,743

DOCUMENT CARRIER ENVELOPE CONSTRUCTION

Charles W. Tomlinson, Orange, Va., assignor to Acme Visible Records Inc., Crozet, Va.

Filed March 17, 1971, Ser. No. 125,176
Int. Cl. B65d *33/02, 31/12*
U.S. Cl. 229—55 2 Claims



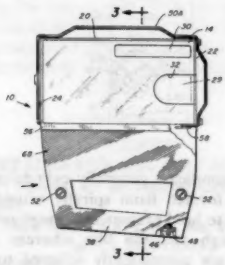
A document carrier adapted to be carried on its bottom edge on a conveyor belt disposed at the base of a pair of defining walls of lesser height than said carrier and further adapted to be flexed about and between upstanding roller means and said belt in angular movement of said belt from between said first defining walls and adjacent similar defining walls. The carrier is composed of opposed faces sealed together at their leading and trailing edges in double spaced lines of vertical seal. Flexible stiffening ribs are disposed in the pockets formed by each of said double lines of seal whereby to prevent undesired flexing of said pocket into similar pockets traveling on carrier belts in adjacent paths formed by adjacent walls. A spaced double line of seals at the bottom edge of said carrier receives a flexible stiffening rib disposed in the pocket formed therebetween to provide the carrier with a controlled amount of lengthwise stiffness and a surface to be frictionally engaged between the conveyor belt and upstanding roller for limited flexing and providing frictional engagement requisite to freely negotiate said turns.

3,724,744

CARD HOLDER FOR METER READERS

William M. Carnahan, 1004 Maple, Sand Springs, Okla.

Filed Nov. 26, 1971, Ser. No. 202,141
Int. Cl. B68b *11/00*
U.S. Cl. 231—2 E 4 Claims



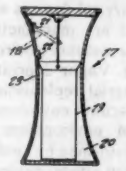
An improved card holder for meter readers including a housing having a portion thereof of dimensions to hold a stack of meter cards, the top of the housing having openings therein through which the user may write upon the upmost card in stack, a metallic member affixed to a portion of the exterior of the housing, a battery carried within the housing, high voltage producing means within the housing connected to the metallic member, and a switch connected between the battery and the high voltage means such that when the switch is turned on high voltage is applied to the metallic member to thereby enable the user to ward off an attacking animal.

3,724,745

COMBINATION OF BAR STOOL AND REFUSE CONTAINER

Joseph K. Brown, 2138 E. 10th Avenue, Honolulu, Hawaii

Filed June 28, 1971, Ser. No. 157,458
Int. Cl. B65d *91/00*
U.S. Cl. 232—43.2 2 Claims



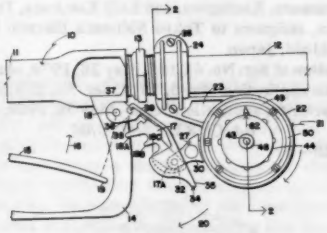
A stool for a bar, the stool consisting of a decoratively contoured hollow cylinder made of rigid plastic and which has a circular foot rest ring secured around it, the top cushion of the stool being removable so to expose an opening providing access for placement of refuse into a removable refuse pail fitted within the interior of the stool.

3,724,746

TIMER OPERATED AUTOMATIC SHUT-OFF FOR FLUID DISPENSING PUMPS

William Heinz, 2425 Bowness Rd., N. W., 42 Alberta, Canada

Continuation-in-part of Ser. No. 8,332, Feb. 3, 1970, abandoned. This application July 26, 1971, Ser. No. 166,231
Int. Cl. B67d *5/08*
U.S. Cl. 222—70 17 Claims

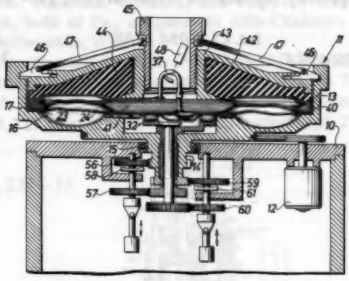


A mechanical timer is attached to a pump nozzle which can be set to shut off when a predetermined amount of fluid such as gasoline has been dispensed. The settings can be either by dollar value or by gallonage as desired.

3,724,747
CENTRIFUGE APPARATUS WITH MEANS FOR MOVING MATERIAL

Hans Peter Olof Unger, Lidingo; Eric J. H. Westberg, Stockholm, and Stephan L. Schwartz, Lidingo, all of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed March 10, 1972, Ser. No. 233,538
Claims priority, application Sweden, March 15, 1971, 3309/71; March 15, 1971, 3310/71
Int. Cl. B04b *1/00*
U.S. Cl. 233—3 5 Claims

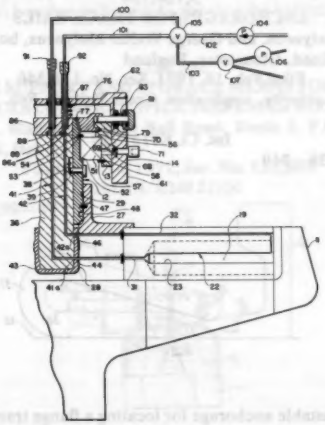


A centrifuge for batch treatment of a liquid, particularly blood, such as for separating blood into fractions of different densities and/or for washing blood cells suspended in a liquid, comprises closed collapsible containers in the centrifuge rotor. Resilient tubing interconnects the containers and a peristaltic pump member mounted on and rotating with the centrifuge rotor acts on the resilient tubing to selectively move liquid therethrough from one container to another and prevent liquid flow through the resilient tubing.

3,724,748
CENTRIFUGE INDEXING SEAL HEAD ASSEMBLY AND METHOD

Kenneth E. Jacobson, Fremont, Calif., assignor to Beckman Instruments Inc., Fullerton, Calif.

Filed Feb. 26, 1970, Ser. No. 14,487
Int. Cl. B04b *11/00*
U.S. Cl. 233—21 20 Claims

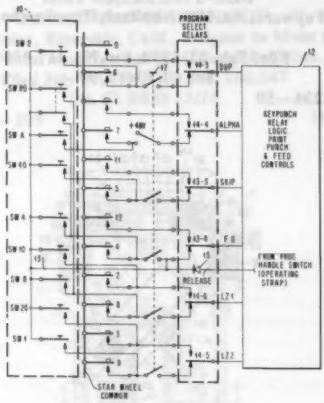


An indexing seal head assembly and method for selectively loading and unloading one or more cells in a multi-cell centrifuge rotor while the rotor is spinning.

3,724,749
KEY PUNCH FEATURE

William F. Beausoleil, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed April 15, 1971, Ser. No. 134,252
Int. Cl. G06k *1/08*
U.S. Cl. 234—18 5 Claims

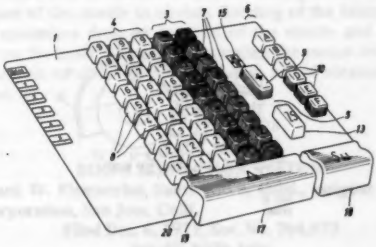


A high-speed column locate feature whereby a keypunch operator may select at random any predetermined column location on a unit record card and control the card punching to either automatically duplicate or skip at high speed to the selected column. A prepunched program card is provided in conjunction with auxiliary column-select keys. The program card has pre-punched coded patterns which are selectable by the column-select keys. By the appropriate choice of column-select keys and the wiring of the keys, a field definition is impressed upon keypunch field definition logic. When the SKIP or DUP control key is depressed, the card being fed automatically feeds the length of the field defined by the field impressed upon the field definition logic.

3,724,750
DEVICE FOR REGISTERING BUSINESS MACHINES

Alfred Hecker, Bielefeld, Germany, assignor to Anker-Werke Aktiengesellschaft, Bielefeld, Germany

Continuation of Ser. No. 809,055, March 20, 1969, abandoned. This application April 6, 1971, Ser. No. 131,811
Int. Cl. G06c *7/02*
U.S. Cl. 235—145 R 9 Claims



Setting device for a registering business machine includes a keyboard having a plurality of columns of keys for posting transactions, a plurality of keys for selecting different machine runs and a plurality of control keys, at least one of the machine run-selecting keys and the control keys being located on the keyboard below the transaction-posting keys and having a key head formed with a profile approximating the curvature of the ball of the hand of a person operating the business

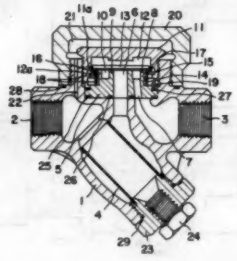
machine, the key head extending transversely to the columns of transaction-posting keys over a width corresponding to the width of at least three of the columns of transaction-posting keys.

3,724,751

DISC-TYPE STEAM TRAP

Katsuji Fujiwara, No. 191, Nishitani, Hiraoka-cho, Kakogawa, Japan

Filed Feb. 22, 1971, Ser. No. 117,416
Int. Cl. F16t 1/04
U.S. Cl. 236—59 **8 Claims**



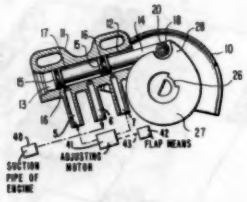
A disc type steam trap having a disc valve floatingly arranged within a pressure chamber which is formed by a valve seat and an inner cover, wherein a bimetallic member to be expanded and contracted due to temperature change, an annular member having a conical or inverted conical slanted face on its lower side, an overhanging portion, a valve seat provided with a conical or inverted conical slanted face, a flat annular member, and annular grooves are provided in pertinent combinations to assure high performance of the trap.

3,724,752

CONTROL DEVICE FOR CONTROLLING HEATING AND AIR-CONDITIONING INSTALLATIONS IN MOTOR VEHICLES

Rudolf Andres; Albert Stolz, both of Sindelfingen, and Hermann Moller, Aidlingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Sept. 4, 1970, Ser. No. 69,721
Claims priority, application Germany, Sept. 6, 1969, P 19 45 232.5
Int. Cl. B60h 1/02
U.S. Cl. 236—86 **31 Claims**



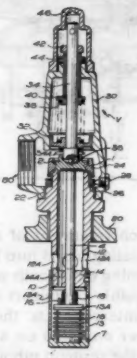
A control device for controlling heating and air-conditioning installations in motor vehicles, particularly in passenger motor vehicles, which controls by means of vacuum, an adjusting motor actuating the fresh or warm air flaps; the control device includes a flap control switch and a temperature switch whereby the flap control switch, which selectively controls the adjusting motor, is adjusted by a rotary knob into a preselected condition of either "air-conditioning off" or "air-conditioning on"; the two switches are preferably arranged in a common housing and the temperature switch is adjustable within an angular range of less than 330° without changing a shifting rod controlling the actuation of the adjusting motor from its position "air-conditioning."

3,724,753

VALVE ACTUATING MEANS

Brian Thornton, Huddersfield, England, assignor to Samuel Birkett Limited, Heckmondwike, Yorkshire, England

Filed Feb. 4, 1971, Ser. No. 112,640
Claims priority, application Great Britain, Feb. 5, 1970, 5,581/70
Int. Cl. G05d 27/00
U.S. Cl. 236—92 C **2 Claims**



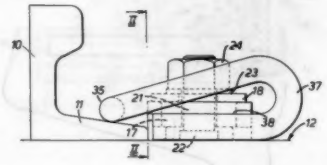
A pressure and temperature relief comprising an upper and lower hollow bodies secured together with the lower body containing a temperature responsive bellows assembly being adapted for insertion into a boiler or other hot water storage vessel and having an inlet into the lower body. The upper attached hollow body has an outlet and a pressure relief valve which simultaneously functions as a temperature relief valve through the agency of an actuating rod connected to the bellows.

3,724,754

ANCHORAGES FOR TRACK RAILS

George Molyneux, and George Walter Molyneux, both of Eastbrook Road, Gloucester, England

Filed Feb. 18, 1971, Ser. No. 116,340
Claims priority, application Great Britain, Feb. 20, 1970, 8,276/70
Int. Cl. E01b 9/30
U.S. Cl. 238—349 **8 Claims**



An adjustable anchorage for locating a flange track rail on a support surface, including a mounting block with a central aperture receiving an eccentric cam plug fitting over a stud fixed in position, for example by welding to the base surface. The cam plug has an octagonal head so that by rotating the plug the block can be moved towards and away from the track

rail, and locked by a nut on the stem. A specially shaped resilient steel clip has a pair of lower limbs fitting in grooves along opposite sides of the base, the two limbs extending away from the rail and having lower parts which curve upwards and forward so a central bite which bears down on the flange of the rail. The grooves for the lower limbs of the clip are specially shaped so that if the clip is displaced away from the rail it tends to exert an increased pressure.

3,724,755

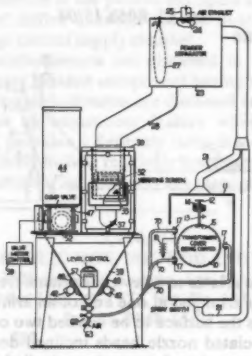
POWDER-AIR VENTURI FOR ELECTROSTATIC SPRAY COATING SYSTEM

Harold G. Diamond, Wexford, and Floyd L. Gustine, Pittsburgh, both of Pa., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 722,078, April 17, 1968, abandoned, and a continuation-in-part of Ser. No. 728,253, May 10, 1968, abandoned, and a continuation-in-part of Ser. No. 41,229, May 28, 1970. This application Sept. 27, 1971, Ser. No. 183,939

Int. Cl. B05b *5/02*

U.S. Cl. 239—15 **4 Claims**



In an electrostatic powder spray system wherein resin powder is fed from a supply hopper to a powder dispensing venturi and is propelled therefrom by pressurized air through a conduit to a spray gun, the venturi housing is constructed of insulating material so that resin powder particles electrostatically charged by the triboelectric effect are not attracted to the venturi housing walls and do not clog the venturi.

3,724,756

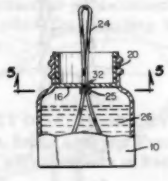
WICK SUPPORT AND STORAGE MEANS FOR NON-SPILLABLE SAFETY WICK DISPENSER BOTTLES

Martin S. Maltenfort, Blue Ball Road, Route 3, P.O. Box 33, Newark, Del.

Filed June 14, 1971, Ser. No. 152,803

Int. Cl. A24f *25/00*

U.S. Cl. 239—47 **11 Claims**



A cup-shaped insert engaged in the neck of a wick dispenser bottle for supporting a generally non-stiffened wick in dispensing position generally outwardly of the dispenser bottle. The cup-shaped member includes means sealingly engaging the wick for precluding spillage of liquid from the container and the cup-shaped member includes means for storage of the dispenser wick in a nonuse position beneath a closure engaged over the neck of the dispenser bottle.

3,724,757

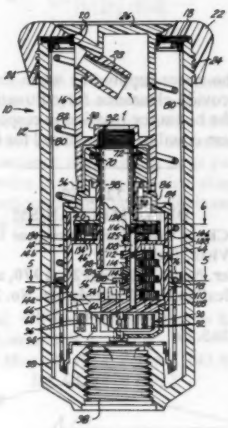
ROTARY POP-UP SPRINKLER

Edwin J. Hunter, Riverside, Calif., assignor to Moist O'Matic Division of Toro Manufacturing, Minneapolis, Minn.

Filed July 27, 1971, Ser. No. 166,347

Int. Cl. B05b *15/10*

U.S. Cl. 239—205 **10 Claims**



A sprinkler is provided with a pop-up nozzle rotatably supported on a housing keyed to a casing for axial nonrotatable movement between positions in which the nozzle is retracted or extended. The housing contains a water actuated motor coupled by gearing to the nozzle for rotation thereof. A seal is fixed to one end of the casing and sealingly surrounds the nozzle when the nozzle is retracted and stationary. When the nozzle is extended and rotating, the seal is disengaged therefrom and sealingly surrounds a part of the housing in stationary relation. The gearing has an internal seal which is protected by the nozzle and is located above the casing in the extended position of the nozzle to obviate flooding of the internal seal. This minimizes drag on rotation of the nozzle and reduces wear on the seals. The gearing coupling the motor and nozzle is alterable to obtain a predetermined arc of rotation of the nozzle.

3,724,758

BOOM IRRIGATION SYSTEM

Richard W. Fizmaurice, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

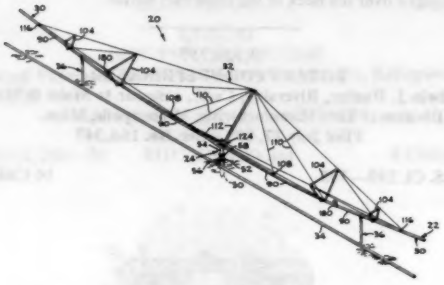
Filed Dec. 6, 1971, Ser. No. 204,973

Int. Cl. B05b *3/06*

U.S. Cl. 239—251 **19 Claims**

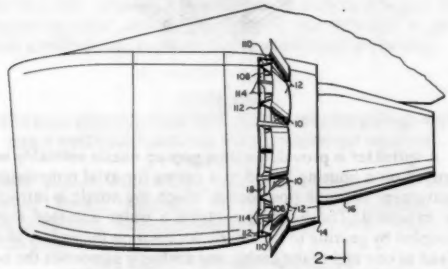
A low application rate boom type irrigation system permanently placed in a field includes two upwardly bowed wings supported by guy wires and rotated about a vertical axis. The boom is rotated by water being discharged in opposite directions from spray nozzles on the two wings aided by wind engaging flaps pivotally supported by each wing. Each boom includes an outer structural tube and an inner water carrying

tube which inner tubes are connected to a water supply source through a screen housing having a plurality of commonly directed chevron seals for simplifying assembly and cleaning. A pair of boom aligning stands stop the wings in positions



parallel with the water supply line when the system is not in operation to provide clearance for cultivation, and hydraulically releases the boom for rotation in response to water pressure in the system equal to that required for irrigation.

3,724,759
DRIVE MECHANISM
Peter H. Ellis, Chula Vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.
Division of Ser. No. 6,739, Jan. 29, 1970, abandoned. This application Dec. 2, 1971, Ser. No. 204,387
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.29 **1 Claim**



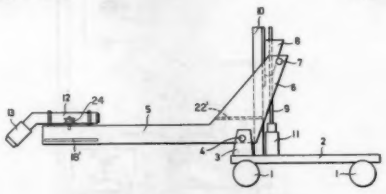
An input shaft is rotatably mounted within a tubular casing and has an eccentric double-gear pinion rotatably mounted thereon. When input shaft rotates, one of the pinion gears rolls epicyclicly around an internal spur gear fixedly attached to inner side of the casing and the other pinion gear rolls epicyclicly around an internal spur gear fixed to one end of an output shaft which supports one end of the input shaft and which is itself journalled within the casing for rotation about the axis of said input shaft. A lever arm is connected to the output shaft and extends through an aperture in the side wall of the casing. Meshed pairs of the pinion gears and spur gears have different numbers of teeth, and cause output shaft to rotate at much lower speed than input shaft.

3,724,760
ADJUSTABLE SHOWER FIXTURE
Earl W. Smith, 716 North "A" Street, Lake Worth, Fla.
Continuation-in-part of Ser. No. 18,931, March 12, 1970, abandoned. This application July 14, 1971, Ser. No. 165,417
Int. Cl. B05b *15/06*
U.S. Cl. 239—282 **3 Claims**

A water distributing device for use in a shower, bath or the like in which a vertical pipe with spray apertures is surrounded by a moveable, water-tight sleeve having predetermined cut out areas which provide for turning on and off the spray as a

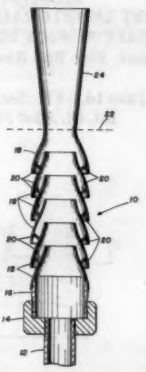
function of relative vertical height by rotating the sleeve a predetermined angular distance.

3,724,761
DEVICE FOR FLAME TREATING SURFACE
Siegfried Stadler, Vercinsstr. 14, 565 Solingen, Germany
Filed June 10, 1971, Ser. No. 151,710
Claims priority, application Germany, June 10, 1970, P 20 28 516.9
Int. Cl. B05b *15/08*
U.S. Cl. 239—286 **7 Claims**



This invention relates to a device for flame treating surfaces wherein there is arranged at one end of an arm which can be displaced across the surface to be worked two or more nozzle tubes with associated nozzle heads inclined downwardly. At least one of the nozzle tubes can be swivelled about an axis parallel with and spaced from the axis of the nozzle tubes.

3,724,762
FLUID DISCHARGE SYSTEM
Kenneth D. Freshour, 2908 Pelham, and John C. Van Dyk, 824 N.W. 15th St., both of Oklahoma City, Okla.
Continuation of Ser. No. 814,716, April 9, 1969, abandoned. This application Feb. 8, 1971, Ser. No. 113,608
Int. Cl. B05b *7/00*
U.S. Cl. 239—427.3 **4 Claims**



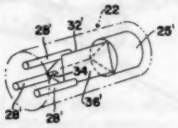
A fluid discharge system for use both as a nozzle and as a fluid oxidizer. The system includes a plurality of identical cup-

shaped converging members positioned at equally spaced points. A stream of water is directed through all of the converging members and is discharged from the last member. Each converging member acts as a venturi to add air to the water. The air both oxidizes impurities in the water and increases the discharge distance of the stream.

3,724,763
SPRAY DEVICE

Arthur R. Braun, 209 East Mildred, Cary, Ill.

Filed April 5, 1971, Ser. No. 130,919
Int. Cl. B05b *1/34*
U.S. Cl. 239—490 **3 Claims**



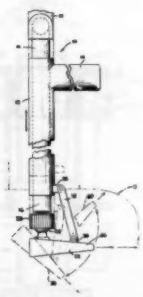
A spray head for discharging a spray pattern in which the entire inner portion of the pattern has liquid atomized therein. A plurality of orifice channels receive fluid radially from a relatively large central supply channel.

Preferred embodiments are disclosed in which the spray head is a unitary molded component having no moving parts. Other preferred embodiments are disclosed in which the spray head includes an adjustment feature whereby a two-part molded head provides a desirable cone-shaped spray pattern at either relatively high or relatively low through-puts, thereby eliminating "dribble" at relatively low through-puts.

3,724,764
HYDRAULIC HOE- METHOD AND MEANS

Homer Hall, 3910 Emerald Avenue, Apt. 111, Torrance, Calif.

Filed May 10, 1971, Ser. No. 141,573
Int. Cl. B05b *15/08*
U.S. Cl. 239—587 **3 Claims**



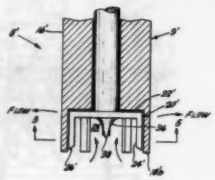
A portable, manually operated nozzle functions in the manner of a hoe by directing a planar jet stream of water to dislodge residual sludge in a substantially closed container by making a thin elongate impact area of high force concentration thereagainst. A universal joint connects the nozzle outlet with an elongate conduit for directing high pressure flow against the sludge layer.

3,724,765
TABLET DISRUPTOR DEVICE

Donald G. Rohrbaugh, Santa Ana, and Everett J. Petersen, Jr., Glendora, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sept. 3, 1971, Ser. No. 177,555
Int. Cl. B02c *18/10, 13/18*
U.S. Cl. 241—46.06 **6 Claims**

A disruptor device particularly suited for rapidly grinding up pharmaceutical tablets in a liquid and agitating the mixture to dissolve the active ingredients of the tablets in the liquid for subsequent chemical analysis. The device comprises a rotatable shaft extending through a hollow member which is formed at its lower end with a series of circularly arranged spaced teeth. The shaft carries at its lower end a rotor provided with a plurality of teeth which are surrounded by the teeth on the hollow member. Rotation of the rotor draws the tablet and liquid upward into the rotor and propels the mixture radially

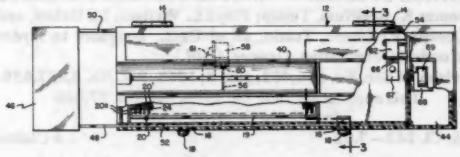


outward through the teeth in the hollow member whereby the tablet will be severed and broken into pieces by the shearing action between the two sets of teeth. Some of the teeth on the outer hollow member are shorter than the other teeth thereon so as to provide entrance openings for large particles to enter the head of the device. An inverted conical shaped deflector is provided on the bottom of the rotor to eliminate stagnant eddy currents within the rotor.

3,724,766
SHREDDER

James M. Bosland, Wayne, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.

Filed May 14, 1971, Ser. No. 143,651
Int. Cl. B02c *19/12*
U.S. Cl. 241—100 **4 Claims**



A paper shredder comprises a housing containing rotatable shredder blades, a driving motor and suitable reduction gears. A cover member containing a paper chute is hingedly supported on the housing. The cover member includes a retaining portion at one end which is adapted to fit on the top of a wastepaper basket. At the other end of the cover member a second retaining portion is secured to slide rails which are adjustable relative to the cover. By moving the retainer member, the relative distance between the two retaining portions can be adjusted to accommodate different-sized wastepaper baskets. A suitable limit switch operated by a sensing wire is secured within the cover member to actuate the motor which controls the shredder blades.

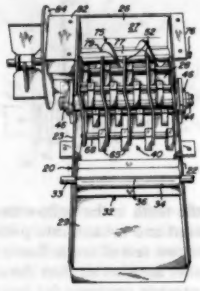
3,724,767
SHREDDER-GRINDER MACHINE HAVING AN IMPROVED ROTOR

John D. Scarbrough, Piqua, Ohio, assignor to Piqua Engineering Inc., Piqua, Ohio

Filed Oct. 7, 1971, Ser. No. 187,395
Int. Cl. B02c *13/04, 13/28*
U.S. Cl. 241—186 R **12 Claims**

A mobile chipper includes a housing which supports a feed roll positioned above a guide chute extending to a rotor having a series of axially spaced circular rotor plates rigidly secured to a driven rotor shaft. Each of the rotor plates is formed of a

heavy gauge sheet metal and has a first segment which is integrally connected by a transverse portion to an axially offset second segment extending parallel to the first segment. A series of peripherally spaced shaft members extend axially through a segments of the rotor plates, and a plurality of hammer elements are mounted on each shaft member between the rotor plates for full 360° rotation. One of the hammer elements is positioned adjacent the first segment of



each rotor plate in radial alignment with the second segment, and another hammer element is positioned adjacent the second segment of each rotor plate in radial alignment with the first segment. These hammer elements cooperate with other hammer elements so that the rotary paths of all of the hammer elements are continuous and uninterrupted across the width of the guide chute. Shredded material is discharged from the housing by the cooperation of a driven screw which extends to a centrifugal blower.

3,724,768

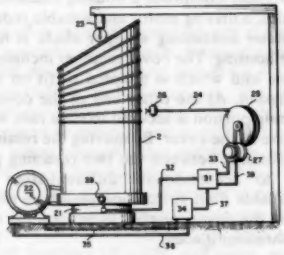
METHOD OF MAKING WRAPPED TUBULAR CONCRETE

Thomas K. Breitfuss, Tustin; Floyd L. Wallace, La Habra, and Joseph P. Zicaro, Tustin, all of Calif., assignors to Hydro Conduit Corporation, Orange, Calif.

Division of Ser. No. 696,402, Jan. 8, 1968, Pat. No. 3,587,659. This application June 16, 1970, Ser. No. 57,846

Int. Cl. B65h *54/00, 81/08*

U.S. Cl. 242—7.02 **4 Claims**



Method of making reinforced concrete inclusive of hollow concrete body of tubular shape having beveled end and reinforcing member wrapped on exterior surface of length of concrete body at beveled end in progression of wraps to form continuous helical assembly. Reinforcing assembly under lesser tension extends along shorter side portion than longer side portion to provide more nearly equal stress in concrete body. Means associated with concrete body onto which reinforcing member is wrapped is utilized for holding reinforcing member against circumferential movement to maintain said preselected tension in reinforcing member.

3,724,769

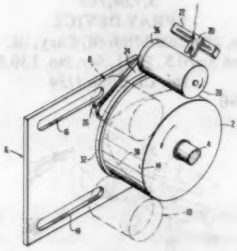
YARN TAKE-UP

Kenneth Brooks, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 2, 1970, Ser. No. 94,395

Int. Cl. B65h *54/42*

U.S. Cl. 242—18 DD **4 Claims**



Yarn take-up for winding cheese-type packages in which a large diameter drive roll imparts rotation to one, two or more yarn packages mounted on bobbins spaced apart around the periphery of the drive roll. Yarn is conducted through a traverse guide and a small diameter roll serves as a print roll between the traverse guide and the surface of the drive roll. The print roll is driven by the drive roll and preferably the yarn passes from the print roll around the front side of the drive roll where it is wound on the respective bobbins.

3,724,770

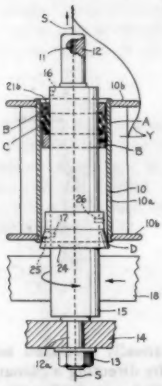
BOBBIN ADAPTER

Robert L. Carroll, 408 McIver St., Greenville, S.C.

Filed Nov. 2, 1970, Ser. No. 86,034

Int. Cl. B65h *75/30, 79/00*

U.S. Cl. 242—46.6 **2 Claims**



An annular body portion, carried by the spindle, has spaced protuberances mounted on the periphery thereof extending into engagement with the barrel of the bobbin when placed thereon.

3,724,771

HUB-PLATFORM ASSEMBLY AND LOOP-SIZING METHOD

Darrell W. Zielke, Valencia, Calif., assignor to Superscope, Inc., Sun Valley, Calif.

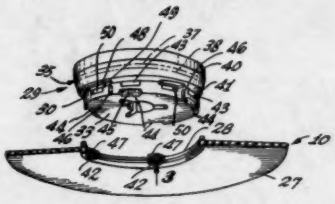
Filed March 12, 1971, Ser. No. 123,689

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 A **23 Claims**

A hub-platform assembly for a continuous loop magnetic tape cartridge in which the hub is mounted on the platform for

indexing between angularly spaced winding and stripping positions and for axial movement through a preselected movement as a result of said indexing, initially being held releasably in the winding position for loading with a tape pancake which is wound around a conical surface tapering toward the platform. When the hub is indexed to the stripping position, the conical



surface is shifted axially to move the larger section thereof, which determined the inside diameter of the pancake, out of the pancake, thereby forming a gap between the hub and the inside diameter permitting the tape to be wound down around the hub by pulling the opposite ends of the tape away from the pancake. The gap size is calculated to produce a loop of predetermined length as this is done.

3,724,772

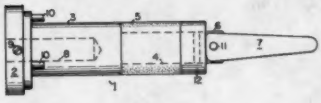
REEL SPINDLE

George S. Hager, Anaheim; Eugene E. Keech, Costa Mesa, and Lawrence S. Dossett, Orange, all of Calif., assignors to Electronic Engineering Co. of Calif., Santa Ana, Calif.

Filed Nov. 11, 1971, Ser. No. 197,779

Int. Cl. B65h *19/02*

U.S. Cl. 242—68.3 **7 Claims**



A spindle for rotatably supporting a reel having both positive and frictional engagement between the spindle and the reel. The positive engagement is made at one end of the spindle, as by means of plural pins which engage plural recesses in the reel. The frictional engagement is made at the other end of the spindle and is provided by a radially expansible elastomer which is expanded by a locking arm. This dual engagement advantageously holds two-piece reels together as well as to the spindle.

3,724,773

SEAT BELT RETRACTOR

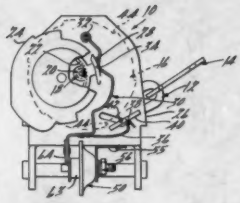
Robert C. Fisher, 580 East Long Lake Road, Bloomfield Hills, Mich.

Filed May 6, 1971, Ser. No. 140,675

Int. Cl. A62b *35/00*

U.S. Cl. 242—107.4 **5 Claims**

The disclosure relates to a seat belt retractor comprising a toothed spool having a seat belt wound thereon and a pawl member adapted to engage a tooth on the spool for limiting



the rotation thereof after a predetermined time interval after the protraction of the belt.

3,724,774

TAPE HANDLING APPARATUS

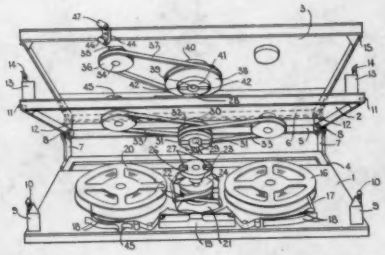
John Hamilton-Fey, Letchworth, England, assignor to International Computers Limited, London, England

Filed May 21, 1971, Ser. No. 145,686

Claims priority, application Great Britain, June 16, 1970, 29,065/70

Int. Cl. G03b *1/04*; G11b *15/32*

U.S. Cl. 242—180 **4 Claims**



Tape handling apparatus includes two or more decks arranged in spaced overlapping relationship, each deck including a tape processing arrangement, and means for driving the processing arrangement extending though the overlapping portions of the decks. The drive means include clutch elements which provide drive connections between adjacent decks, so that all of the tape processing arrangements, can be driven from a single source of drive. Where more than two decks are provided they can be hinged together so that the adjacent decks can be easily separated without breaking the drive between other decks.

3,724,775

FILM REEL SUPPORT ASSEMBLY FOR PROJECTORS

Arthur E. Nupnau, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

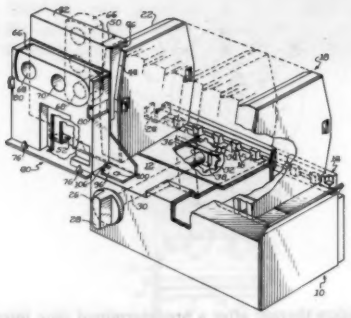
Filed April 13, 1970, Ser. No. 27,551

Int. Cl. G03b *1/04*; G11b *15/32*

U.S. Cl. 242—180 **5 Claims**

A support assembly adaptable for supporting varying sized reels of film at a projection station on a motion picture projec-

tor. The support assembly includes a gate member having a first position to permit projecting any one of a plurality of like



sized reels of film supported on the projector and having a second position to permit projecting a selected one of varying sized reels of film.

3,724,776

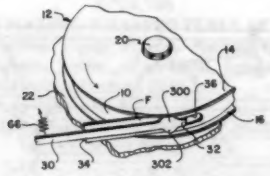
FILM FEEDING APPARATUS

Edward S. McKee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 9, 1971, Ser. No. 113,922

Int. Cl. G03b *1/02, 1/58*

U.S. Cl. 242—195 **6 Claims**



Film feeding apparatus for a motion picture projector includes guide members cooperating with a hook-like member for guiding the hook member into a position in close proximity to a rotating roll of film or the like for engaging the film through an opening in a leading end portion of the film. In the illustrated embodiment the guide members are on the hook member and cooperate with flanges of a film reel for accurately positioning the hook with respect to the leading end portion of the film, thereby assuring engagement between the hook and the film and minimizing the size of the opening in the film that is required for high reliability of operation.

3,724,777

MOTION PICTURE PROJECTOR APPARATUS

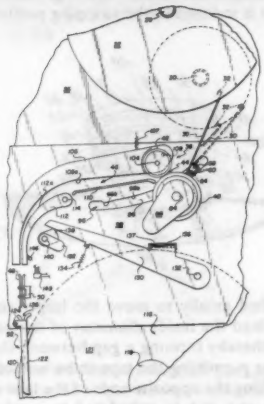
William A. Martin, and John Q. Saint Clair, II, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1970, Ser. No. 77,959

Int. Cl. G03b *1/04, 1/58*

U.S. Cl. 242—195 **7 Claims**

Motion picture projector apparatus includes a hook-like member that is adapted to be moved into close proximity to a rotating roll of film or the like for engaging the film through an opening in a leading end portion of the film. The hook member then delivers the leading end portion of the film to self threading apparatus of the projector, and the hook is auto-



matically disengaged from the film. The projector apparatus disclosed provides for automatic rewind of film, and for review or manual rewind of film.

3,724,778

OPERATING APPARATUS FOR A CARTRIDGE TAPE RECORDER

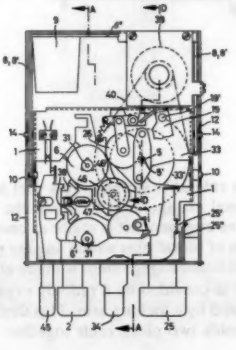
Dieter Kuhnlein, Nurnberg; Reinhold Emmert, Furth/Bayern, and Georg Haag, Nurnberg, all of Germany, assignors to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Furth-Bayern, Germany

Filed Sept. 13, 1971, Ser. No. 179,981

Claims priority, application Germany, Sept. 12, 1970, P 20 45 230.6

Int. Cl. G03b *1/04;* **G11b** *15/32, 23/04*

U.S. Cl. 242—198 **12 Claims**



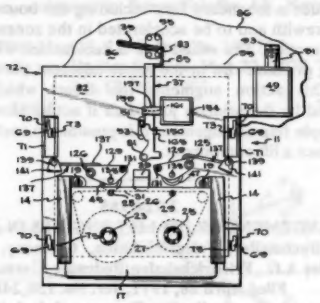
The carrier of the operating means for a tape cartridge, is mounted for rectilinear movement between an inoperative position and an operative position in which the operating means are inserted into the cartridge for operating the tape. Double armed lever means support at one end the carrier, and are at the other end loaded by a weight so that the carrier and the operating means thereon, are counter-balanced and can be moved by a small force to and from the operative position.

3,724,779

CASSETTE PLAYBACK AND/OR RECORDING APPARATUS WITH LOADING EASE FEATURE

Robert J. Fanella, Villa Park; Donald W. Marcinkus, Arlington Heights, and Glenn E. Sterly, Carol Stream, all of Ill., assignors to Ampex Corporation, Redwood City, Calif.

Filed Dec. 23, 1970, Ser. No. 100,872
Int. Cl. G03b 1/04; G11b 15/32, 23/04
U.S. Cl. 242—198 7 Claims



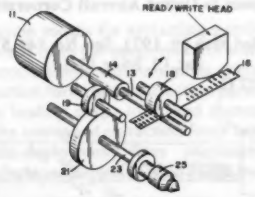
A significant reduction in the amount of manual force required to insert a cassette into operative position within a tape playback and/or recording apparatus is achieved by means sensing the inward movement of the cassette and a carriage movable thereby and means operated by the sensing means to shift some of the operating mechanisms in the apparatus against spring forces and friction forces. The means for sensing the inward movement of the cassette and carriage may be in the form of a cam surface on a pawl or lever which is pivoted to operate a switch to cause operation of means including a "repeat" solenoid to shift the tape transporting means to place a forward feed pinch roller in operative and the reverse feed pinch roller in an inoperative position independently of the manual force inserting the cassette and moving the carriage.

3,724,780

CASSETTE LOADING MAGNETIC TAPE DRIVER

Richard N. Wolf, North Billerica, Mass., assignor to Memodyne Corporation, Newton, Mass.

Filed July 23, 1971, Ser. No. 165,663
Int. Cl. B11b 15/32; G03b 1/04
U.S. Cl. 242—206 4 Claims



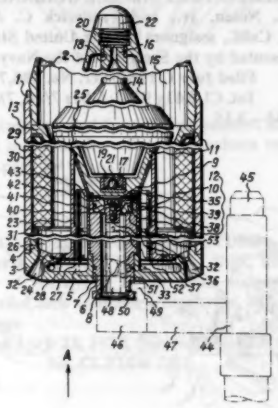
A cassette loading magnetic tape drive system utilizing a stepping motor directly coupled to a capstan shaft which cooperates with a pinch roller to provide tape drive. The same stepping motor drives a slip clutch through a transfer roller, the slip clutch providing controlled torque to a cassette reel and controlled tension on the tape through a resilient driver hub which engages all splines of the cassette reel. Stepping motion is transferred from the motor only when the entire system is in operation.

3,724,781

SPIN-STABILISED ROCKET PROJECTILE

Abraham Makow, Ramat Gan, Israel, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle, A.G., Zurich, Switzerland

Filed Feb. 10, 1971, Ser. No. 114,321
Claims priority, application Switzerland, Feb. 27, 1970, 2897/70
Int. Cl. F42b 13/24, 11/04
U.S. Cl. 244—3.23 8 Claims



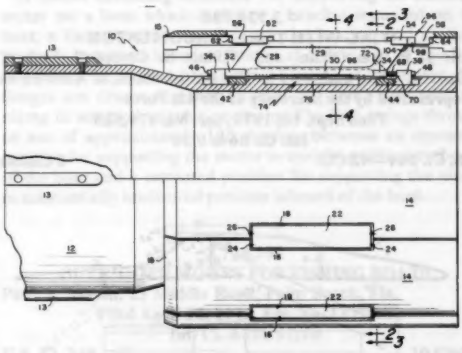
A spin-stabilized rocket projectile of the type containing a propellant grain and nozzles for the generation of propulsive thrust and spin, said nozzles being disposed in a common nozzle. Propellant grains are provided for providing thrust for spin. A spin generating nozzle is disposed between each pair of adjacent propulsion nozzles. This arrangement allows rotation to be imparted to the projectile before it leaves its guide to improve stability during flight by allowing spin to be generated separately from forward propulsion.

3,724,782

DEPLOYABLE AERODYNAMIC RING STABILIZER

Harry J. Gauzza, Silver Spring, and Eugene V. Horanoff, Clarksville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 22, 1971, Ser. No. 165,240
Int. Cl. F42b 25/06, 25/02
U.S. Cl. 244—3.27 7 Claims



A foldable ring assembly for the aerodynamic stabilization of missiles. The ring assembly includes a plurality of arcuate segments pivotally interconnected by hinges between adjacent segments. Each segment is supported on the missile by a radial strut which is pivotally connected to both the missile and the

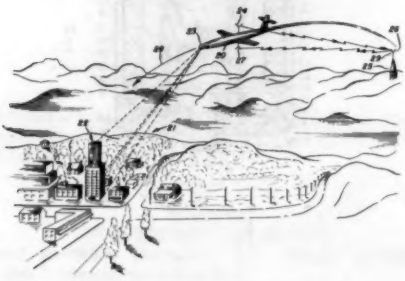
segment. When in a missile launch tube, the struts are held in positions tangential to the missile and the interleaved segments partially overlap one another in close proximity to the missile case. Upon exit from the tube, torsion springs rotate the struts into radial positions causing the arcuate segments to unfold into a complete ring concentrically positioned around the missile.

3,724,783

DISCRIMINATORY MISSILE GUIDANCE SYSTEM

William J. Nolan, Jr., and Frederick C. Alpers, both of Corona, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 1, 1952, Ser. No. 296,773
Int. Cl. F41g 9/00; G01s 7/10, 7/62
U.S. Cl. 244—3.15 12 Claims



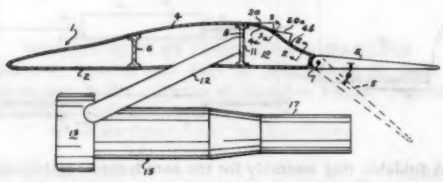
1. In a discriminatory guidance system for self-directing an aircraft to home on a selected target disposed within a group of similar targets, a screen for receiving the target image, a first and second cyclically operating generating means cooperatively performing to convert the received screen image into a series of sequential electrical image signals, pulse producing means actuated by the first generating means for providing a tracking pulse at a given time during selected cycles of the first generating means, gating means responsive to the pulse producing means and jointly controlled by both generating means to allow tracking pulse passage during a given portion of the second generated cycle, and coincident measuring means energized by the electrical image signals and the gated tracking pulses to provide error signals proportional thereto, said error signals fed back to the pulse producing means for controlling the time during the cycle of the first generating means at which the tracking pulse is generated.

3,724,784

WING WITH THRUST AUGMENTOR

Hans J. P. von Ohain, and William S. Campbell, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 10, 1971, Ser. No. 179,520
Int. Cl. B64c 9/38
U.S. Cl. 244—42 CC 8 Claims



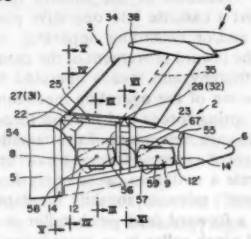
The invention relates to a propulsion and sustension system for aircraft in which a wing is provided having an extended laminar flow airfoil section with the maximum thickness aft of the 70 percent chord point. The wing has at least one surface having a convex portion extending aft of the point of maximum thickness and coupled to a concave section extending to the trailing edge of the airfoil section or faired into the surface of a flap extending beyond the airfoil trailing edge. The wing is provided in the vicinity of the aforementioned convex section with a plurality of nozzles connected to a primary source of air under pressure. The nozzle assemblies extend spanwise in closely spaced relation and inject high velocity jets of air into the airflow over the wing in the zones over the convex portion and induce a secondary flow including the boundary layer to mix therewith and to be accelerated in the zones adjacent the convex section. The mixed flow is decelerated with an accompanying pressure rise in the zones adjacent the concave section. This action augments the thrust which would be produced by the primary jets of air if acting alone. By means of a simple flap arrangement it is possible to vector the thrust to produce a lift component.

3,724,785

ARRANGEMENT OF JET LIFT ENGINES IN AIRCRAFT

Anton Buchstaller, Friedrichshafen, Germany, assignor to Dornier A.G., Friedrichshafen/Bodensee, Germany

Filed April 28, 1971, Ser. No. 138,248
Claims priority, application Germany, July 4, 1970, P 20 33 218.7
Int. Cl. B64d 29/04
U.S. Cl. 244—55 10 Claims



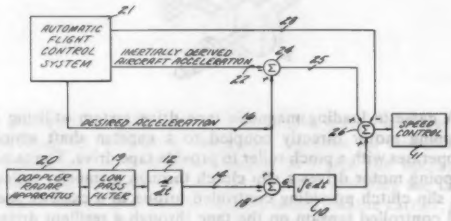
The disclosure is of an arrangement of a jet lift engine in an aircraft, the engine being positioned in a substantially vertically-extending bay in the aircraft fuselage at least partially in the area of the rudder assembly. There are means for supporting the rudder assembly above the bay, and air inlet openings leading into the bay on both sides of the rudder assembly, the openings terminating in a common mixing chamber above the engine.

3,724,786

AIRCRAFT GROUND SPEED CONTROL SYSTEM

Don L. Adams, Fairfield, and Louis S. Cotton, Monroe, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed May 20, 1971, Ser. No. 146,575
Int. Cl. B64c 13/50
U.S. Cl. 244—77 G 2 Claims



An integration of the difference between a desired aircraft acceleration and the actual aircraft acceleration provides a

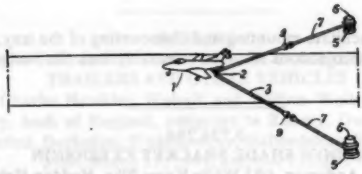
signal which is compared with an aircraft speed dependent parameter for generating a signal used to cause the aircraft to alter its acceleration to the desired value. The actual acceleration of the aircraft is determined by differentiating a signal proportional to the aircraft ground speed, which is provided by a doppler radar apparatus.

3,724,787

LINE OR BAND FOR ARRESTING AIRCRAFT

Per Borje Fonden, and Karl Ove T. Walander, both of Linkoping, Sweden, assignors to Borgs Fabriks AB, Norrkoping, Sweden

Filed May 21, 1971, Ser. No. 145,702
Claims priority, application Sweden, May 22, 1970, 7037
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 A **3 Claims**



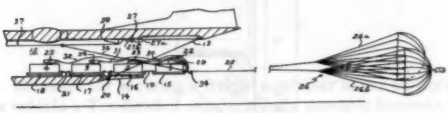
An aircraft arresting apparatus having a line, band or cable for engagement by a landing aircraft, the line, band or cable being composed of a plurality of lengths or sections of different tensile strength, the lengths being suitably united or joined together in endwise relationship.

3,724,788

RAPID EXTRACTION SYSTEM

Gene A. Petry, Conover, and Michael H. Reagan, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed June 3, 1971, Ser. No. 149,493
Int. Cl. B64d *9/00*, *1/00*
U.S. Cl. 244—137 R **4 Claims**



Rapid extraction means for extracting a series of interconnected cargo loads from the cargo space of a delivery aircraft, in which a force-transfer mechanism is utilized to initially apply the extraction force of an extraction parachute assembly directly to the leading cargo load, and thereafter automatically transfer the continued extraction force being exerted to a series of static-deployment lines interconnected with a recovery parachute assembled to each cargo load.

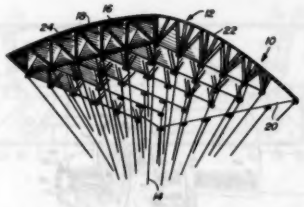
3,724,789

RAM AIR GLIDE PARACHUTE

Stephen L. Snyder, 331 Cherry Hill Boulevard, Cherry Hill, N.J.

Filed Feb. 2, 1970, Ser. No. 7,687
Int. Cl. B64d *17/20*
U.S. Cl. 244—145 **16 Claims**

An airfoil-shaped parachute having airflow channels formed below a top flexible canopy between ribs extending from the leading edge of the canopy toward its trailing edge. Suspension lines are secured to the lower edges of the ribs for supporting a payload. The airflow through the channels and the distribution of stress applied from the suspension lines, maintains the airfoil shape of the inflated parachute to sustain a controlled glide path for the payload.

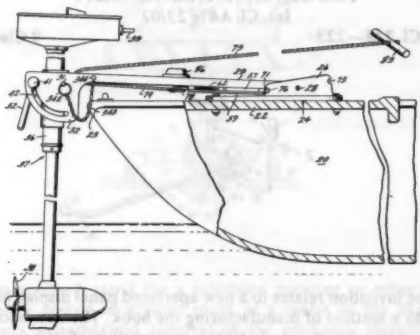


3,724,790

MOTOR MOUNTING STRUCTURE

Garrett H. Harris, Jackson; Edward A. Dutt, and Billy J. Savage, both of Starkville, all of Miss., assignors to The Herschede Hall Clock Company, Starkville, Miss., by said Dutt and Savage

Filed April 23, 1971, Ser. No. 136,755
Int. Cl. F16m *1/02*
U.S. Cl. 248—4 **5 Claims**



A motor mounting structure for supporting an outboard motor on a boat which includes a bracket mounted on the boat, a link pivotally mounted on the bracket and a clamp pivotally mounted between flanges at a free end of the link. The clamp engages and supports a housing of the motor. The flanges are drawn together to grip the clamp and hold the clamp in selected angular positions. The link swings through an arc of approximately 180 degrees between an operative position for supporting the motor in upright position outboard of the boat and a retracted position for supporting the motor in substantially horizontal position inboard of the boat.

3,724,791

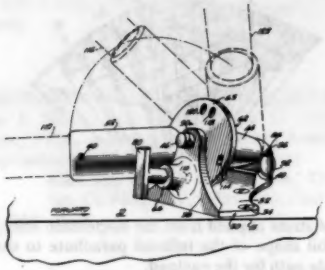
OUTRIGGER MOUNT FOR FISHING BOATS

Paul A. Mason, 25 Middle Road, Palm Beach, Fla.

Filed April 26, 1971, Ser. No. 137,203
Int. Cl. A01k *97/10*
U.S. Cl. 248—42 **10 Claims**

The present invention provides an outrigger mount which includes a tubular socket for the reception of the butt end of an outrigger pole, the tubular socket being pivotally mounted on a bracket which is adapted for horizontal mounting, generally required on open type fishing boats, as well as for

vertical mounting on boats with deck houses. The tubular socket is angled relative to the pivot which is in turn angled relative to the mounting surface to provide a compound angular relationship between the socket and the mounting surface.

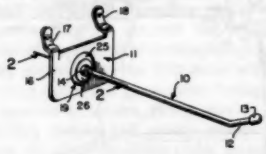


Indexing and detent means are provided whereby the outrigger pole may be selectively rotated to and locked in a raised or "stowed" position, extended or "fishing" positions and a lowered position for passing under bridges or the like.

3,724,792
APERTURED PANEL HOOK AND METHOD FOR MANUFACTURE

David R. Thalenfeld, 162-41 Powell's Cove Boulevard, Beachurst, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,271
Int. Cl. A47g *23/02*
U.S. Cl. 248—223 9 Claims



The invention relates to a new apertured panel display hook and to a method of manufacturing the hook. The new hook is characterized particularly by the construction of its principal components, a base member and a hook member, and the manner in which these two components are secured together. The base member is stamped and formed of sheet or strip metal stock to provide a cylindrical walled opening. The base member is given a surfaCe plating treatment subsequent to its formation but prior to assembly with the hook member. The hook member is formed of pre-plated wire stock, which is cut to length, shouldered and headed, and then inserted into the walled opening of the base member. The base and hook members are then locked together by mechanical deformation of one or both parts.

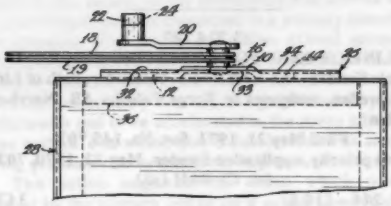
The new constructional technique enables extra ordinary reductions in manufacturing cost to be realized while, at the same time, providing an end product which is actually far superior to the conventional product.

3,724,793
MOUNTING MEANS FOR CARRIER

Hamilton L. Wood, Charlottesville, Va., assignor to Acme Visible Records, Inc., Crozet, Va.

Filed Sept. 14, 1971, Ser. No. 180,358
Int. Cl. A47b *96/06*
U.S. Cl. 248—247 6 Claims

A horizontal tray or other carrier is supported at its ends by spaced hanger brackets which overhang spaced projecting arms of a support. The brackets may comprise detent projections locking against the bottom surface of the arms. The

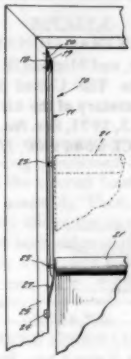


brackets facilitate mounting and dismounting of the tray, and the detent projections serve to releasably lock the hanger in position.

3,724,794
WINDOW SHADE BRACKET EXTENSION

William R. Anderson, 603 White Horse Pike, Haddon Heights, N.J.

Filed April 19, 1971, Ser. No. 135,190
Int. Cl. A47h *1/13*
U.S. Cl. 248—264 1 Claim



A pair of extensions attachable to the conventional brackets that are used to support a window shade along the top of a window, the extensions hanging downward and the lower ends being adaptable to support the window shades at a lower elevation, so that the upper portion of the window area is not blocked by the shade, thus allowing air to circulate from the out-of-doors and into the room when the upper window sash is lowered.

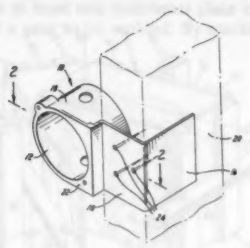
3,724,795
SELF-MOUNTING ELECTRICAL CONNECTION BOXES

Joseph R. Callanan, 382 Homeland Drive, Whitman, Mass.

Filed Nov. 12, 1970, Ser. No. 88,587
Int. Cl. F16m *13/00*
U.S. Cl. 248—360 7 Claims

Electrical connection boxes having an alignment arm

member extending from the box to align it on a building wall member, and a holding leg member extending from the arm to



hold the box on the building wall member for permanent fastening.

3,724,796

MEANS FOR MOUNTING FREIGHT CONTAINERS ON TRAILERS AND OTHER VEHICLES

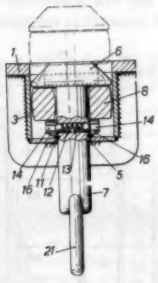
John Charles Hawkins, Walsall, and William Waite, Wednesbury, both of England, assignors to Rubery, Owen & Co. Limited, Darlaston, Wednesburey, Staffordshire, England

Filed March 11, 1971, Ser. No. 123,261

Claims priority, application Great Britain, Jan. 30, 1970, 4,514/70; March 14, 1970, 12,388/70

Int. Cl. B65j 1/22

U.S. Cl. 248—361 R **6 Claims**



In means for securing a freight container to the platform of a vehicle a Tee-headed spindle axially movable between projected and retracted positions in a housing and angularly movable between fastening and releasing positions passes through an element mounted on the spindle for axial movement therewith and movable with the spindle into and out of a position in which it holds the spindle in the projected position, the spindle being movable angularly independently of the said element between the fastening and releasing positions.

3,724,797

RESILIENT SEAT

Herbert Freitag, Koblenz-Lutzel, and Wilhelm Westerteiger, Oberlahnstein, both of Germany, assignors to Stabilus Industrie und Handelsqesellschaft mbH, Koblenz-Neuendorf, Germany

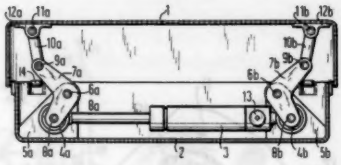
Filed Feb. 4, 1971, Ser. No. 112,552

Claims priority, application Germany, Feb. 17, 1970, P 20 07 140.3

Int. Cl. F16m 13/00

U.S. Cl. 248—400 **12 Claims**

The seat for a chair or vehicle has two box-shaped portions which telescopically engage each other for vertical expansion and contraction of the seat. A pneumatic spring mounted in the space enclosed by the boxes biases the boxes apart by



means of levers carrying links or rollers or by means of cams and rollers. The spring axis is horizontal so that the minimum height of the seat is very small.

3,724,798

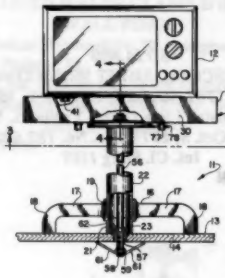
STAND FOR SUPPORTING AN APPLIANCE

Joseph A. Lucasey, 2950 Northwood Drive, Alameda, Calif.

Filed March 22, 1971, Ser. No. 126,584

Int. Cl. A47g 29/00

U.S. Cl. 248—418 **9 Claims**



An antitheft stand for a television receiver or other applicance placed in a guest room of a motel or the like to prevent unauthorized removal of the appliance therefrom. The stand includes a base supported upon the floor of such room, a post extending upwardly from the base, and a platform structure mounted on the post and composed of two separable sections one of which is an underlying closure or receptacle secured to the post. A tie rod extends from the inside of the closure through the post and base and is fixedly attached to the floor of the room to hold the components of the stand together as well as to secure the same to the floor. A lock releasably secures the platform plate section and closure section to each other and thereby prevents access to the means used to fasten the plate to the television receiver and therefore prevents removal of the receiver from the stand and from the floor to which it is attached.

3,724,799

RING DISPLAY DEVICE

George L. Dotson, Bliss, Idaho, assignor to Datson and Evans, Inc., Bliss, Idaho

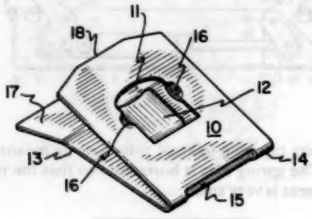
Filed April 19, 1971, Ser. No. 135,167

Int. Cl. A47b 97/04

U.S. Cl. 248—450 **1 Claim**

A spring-clip device for displaying ring-type jewelry is disclosed. The device comprises a single flat strip of material such as metal folded to form a top member and a bottom member wherein the top member is disposed above the bot-

tom member at an angle of about 60° or less. A tongue projecting above the bottom member has a flat portion which passes through an opening in the top member when the top member is depressed, the opening in the top member being larger in area than the flat portion of the tongue. A ring,



bracelet or other ring-type display device is held in position between the upper surface of the top member and the lower surface of the tongue. Also disclosed are means of assembling these spring-clip devices together to provide a large display for a plurality of rings, bracelets, etc.

3,724,800

TELESCOPIC SIGHT MOUNTING

Irving N. Rubin, 21781 Straford, Oak Park, Mich., and Ivan Jimenez, 1780 Ouster Lane Drive, Ypsilanti, Mich.

Filed Oct. 8, 1971, Ser. No. 187,628

Int. Cl. F41g *1/38*

U.S. Cl. 248—205 R **5 Claims**

A telescopic sight mounting formed of a mounting bar for fastening upon the side of a rifle, and a pair of ring-type scope holding clamps fastened upon the upper edge of the bar, with the forward clamp being pivotable about a vertical axis, and a rear clamp being arcuately movable in a horizontal plane for horizontally adjusting the angle of the scope relative to the rifle, and with the means for holding and moving the rear clamp being normally concealed by the clamp itself.

3,724,801

COLUMN FORM AND CLAMP ASSEMBLY

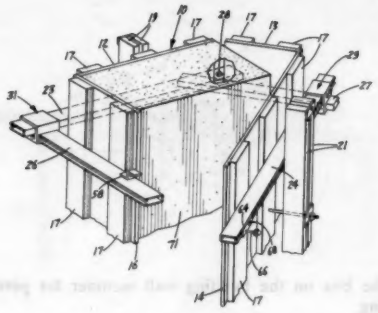
Wally O. Seis, and Alfred L. Paul, both of Minneapolis, Minn., assignors to Brock-White Co., Minneapolis, Minn.

Filed May 20, 1971, Ser. No. 145,333

Int. Cl. E04g *13/02*

U.S. Cl. 249—48 **17 Claims**

A form usable to construct a concrete column is held in a closed position by a number of clamp assemblies surrounding the form. Each clamp assembly has two pairs of channel bars held in adjustable right angle relationship with a corner



bracket unit. A single pivot joins one bar of each pair of bars together. A quick release connector holds the other bars of each pair of bars together.

3,724,802

PLASTICS MOULDING PRESSES

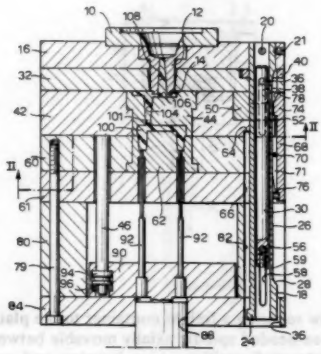
Giovanni Bessolo Veneria, Ivrea, Italy, assignor to Ing. C. Olivetti & C.S.P.A., Ivrea, Italy

Filed Sept. 3, 1971, Ser. No. 177,607

Claims priority, application Italy, Sept. 18, 1970, 70145 A/70

Int. Cl. B28b *7/10*

U.S. Cl. 249—67 **4 Claims**



A moulding press has a series of hollow guide bolts, each connected at one end to a plate of the press and having a head defining the maximum distance of another plate that slides on the bolt. A pin is contained slidably in the bolt and has transverse spikes protruding through longitudinal slots in the wall of the bolt. The spikes engage certain plates of the press to define their maximum movements.

3,724,803

GEAR MOLDING DEVICE

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif.

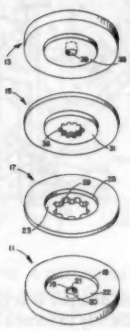
Filed Sept. 29, 1970, Ser. No. 76,452

Int. Cl. F16k *51/00*

U.S. Cl. 249—102 **7 Claims**

A device useful for molding gears of plastic or other material and particularly for molding multiple gears, which device comprises first and second opposed end plates, the first end plate preferably having a removable insert therein for selectively controlling the hub dimensions for molded gears, and

the second end plate preferably having at least an opening therein for admitting the molding material. Disposed between the end plates is at least one additional plate containing the configuration of a gear to be molded. By stacking additional

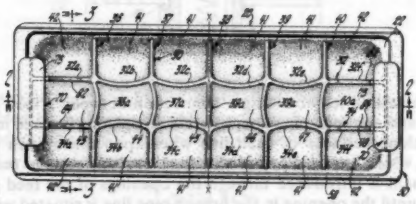


plates having configurations of additional gears one on top of another between the two end plates, a plurality of multiple integrally-formed gears of selected dimensions and pitch, and with selected hub and shaft holes can be readily formed.

3,724,804
FLEXIBLE GRID FOR FREEZING TRAYS

Lewis B. Campbell, Miamisburg, and Joe P. Pietrzak, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1971, Ser. No. 168,978
Int. Cl. F25c *1/24*
U.S. Cl. 249—128 **6 Claims**



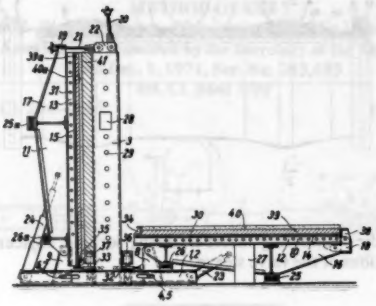
Integrally molded palm hold handles are located at either end of a resilient grid for use with a freezing tray. The handles are formed such that the grid can be readily twisted in combination with the tray during a primary ice release operation and after removal of the grid the handles allow a secondary ice release operation in cooperation with certain of the ice cube compartment wall segments formed in lobed fashion enabling the grid to be flexed and twisted thereby readily releasing the ice cubes therefrom.

3,724,805
SLAB CASTING APPARATUS

Armin Kleiber, Mozartstrasse 5, and Wilfred Schmidt, Rennbergstrasse 4, both of 75 Karlsruhe, Germany

Filed Nov. 23, 1970, Ser. No. 91,789
Claims priority, application Germany, Jan. 16, 1970, P 20 01 825.1
Int. Cl. B28b *7/22*
U.S. Cl. 249—171 **3 Claims**

A vertical mould for casting concrete or other hardenable material in which one side of the mould can be lowered into a horizontal position to permit the preforming of certain layers

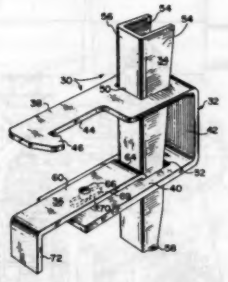


and the positioning of fittings and reinforcement before being raised and secured for the main casting operation.

3,724,806
SELF-CONTAINED WALER CLAMP FOR CONCRETE WALL FORM

James C. Shoemaker, Hampshire, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Division of Ser. No. 79,235, Oct. 8, 1970, Pat. No. 3,655,162.
This application Sept. 24, 1971, Ser. No. 183,369
Int. Cl. E04g *17/00*
U.S. Cl. 249—219 W **2 Claims**



An inseparable waler clamp assembly for convenient manual application to the protruding end of a tie rod for securely clamping either a single or a dual waler hard against the outer side of a series of upstanding and edge-to-edge wall form panels. In one form of the waler clamp assembly, the design is such as to accommodate attachment to a cylindrical tie rod or tie wire having a button-like enlargement on one end thereof.

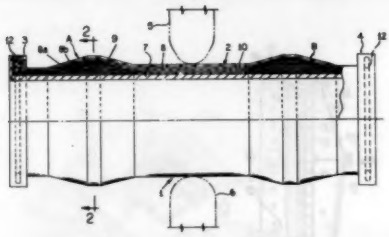
3,724,807
PINCH VALVE SLEEVE

Lawrence D. A. Jackson, Montreal, Quebec, Canada, assignor to Lawjack Equipment Limited, Montreal, Quebec, Canada

Filed Dec. 23, 1970, Ser. No. 100,895
Int. Cl. F16k *7/06*; F16l *11/08*
U.S. Cl. 251—7 **4 Claims**

A pinch valve sleeve having an inner wall of elastomeric

material and reinforcing outer wall of fabric and a pair of circumferential reinforcing members built into the outer wall of

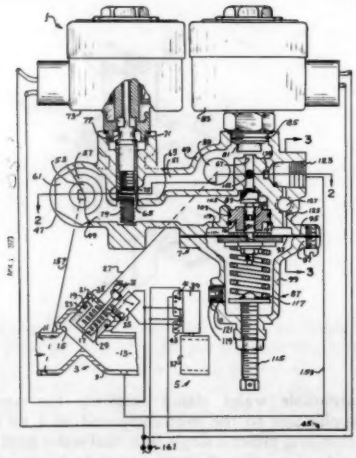


fabric, the reinforcing members being located adjacent the end portions of the valve sleeve.

ERRATUM

For Class 251—9 see:
Patent No. 3,724,818

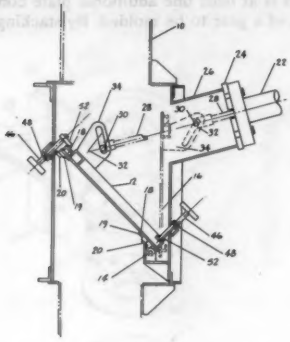
3,724,808
TWO STAGE FLOW CONTROL SYSTEM AND PILOT
Harry Sugden, Jr., Statesboro, Ga., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jan. 10, 1972, Ser. No. 216,604
Int. Cl. F16k *15/00*; F16k *31/12*
U.S. Cl. 251—30 **15 Claims**



A compound pilot of multiple function provides a greatly simplified two stage flow control valve and flow regulator.

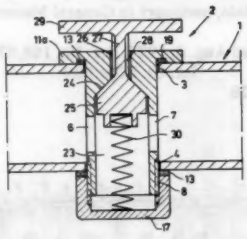
3,724,809
SHUT-OFF DAMPER
Salvatore J. Reale, Wayne, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed Nov. 1, 1971, Ser. No. 194,211
Int. Cl. F16k *31/16*
U.S. Cl. 251—58 **4 Claims**

A shut-off damper which can be actuated by an air cylinder and closed so that there is substantially no leakage passed it. A



bearing surface on the damper is urged against a seating surface on the duct sufficiently to form a hermetic seal.

3,724,810
VALVED PIPE LINE CONNECTION
Rune Sigvard Andersson, Ossjo 43, Angelholm, Sweden
Filed Jan. 14, 1971, Ser. No. 106,322
Claims priority, application Sweden, Feb. 18, 1970, 2052/70
Int. Cl. F16k *51/00*; F16l *41/00*
U.S. Cl. 251—145 **7 Claims**

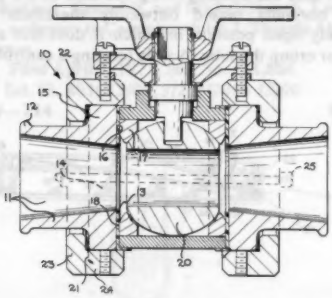


A method for obtaining a connection between a feed pipe line and a branch pipe line, wherein an opening is made in the envelope surfaces of each line whereupon the branch pipe line, which has been provided with at least one annular sealing element is introduced through the openings of the feed pipe line until the opening in the branch pipe line is situated within the feed pipe line and until the sealing element for sealing the opening in the envelope surface of the feed pipe line under pressure contacts said envelope surface, so that the branch pipe line is permanently fixed.

3,724,811
CERAMIC PIPE COUPLING DEVICE
William E. Price, Sylvania, and Paul W. Dullabaun, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 23, 1970, Ser. No. 83,529
Int. Cl. F16l *9/10, 23/00*
U.S. Cl. 251—148 **1 Claim**

A device for connecting piping parts, such as a pipe section, to a ball valve, in a piping system. The invention comprises, in combination, a glass-ceramic connector having a radially-extending peripheral flange at one end, and a retaining ring of a slightly greater diameter than the connector, the ring having a converse mating portion with the flange, the ceramic connector placed in an abutting relationship with another portion of the piping system, such as a ball valve. The retaining ring is positioned about the peripheral flange of the glass-ceramic

connector; a similar connector and ring are positioned on the other end of the piping system, such as a ball valve, and means pressing the ring against the flange portion of the connector so as to hold the ring against a gasket interposed between the ring

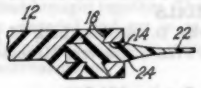


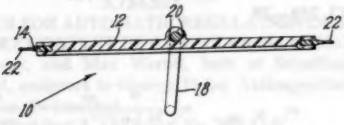
and the flange of the valve. A peripheral bead at the other end of the connector provides a means for joining the connector to the other parts of a piping system, providing a glass-ceramic path for fluid flows.

3,724,812
DAMPER ASSEMBLY

Donald C. Richardson, Clarkston, Mich., assignor to Warren Fastener Corporation, Mount Clemens, Mich.

Filed Nov. 17, 1971, Ser. No. 199,627
Int. Cl. F16k *1/26*
U.S. Cl. 251—306 **5 Claims**



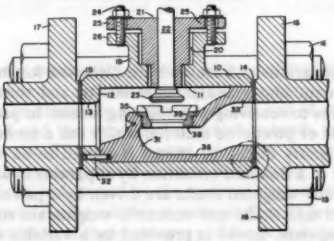


A tough, light weight and economical damper assembly is provided by molding a flexible plastic sealing margin into the slotted locking rim of a relatively rigid plastic main body.

3,724,813
VALVE WITH REMOVABLE SEATING MEANS

Hans D. Baumann, Foxboro, Mass., assignor to Masoneilan International, Inc., Norwood, Mass.

Filed May 7, 1971, Ser. No. 141,204
Int. Cl. F16k *51/00*
U.S. Cl. 251—360 **17 Claims**

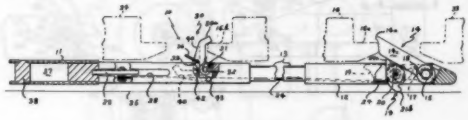


Control valve with integral bonnet and endwise removable insert providing the valve seat means. Provision for valve plug means larger or smaller than the bonnet opening, and, where larger, for removal of the plug end-wise of the valve body upon withdrawal of the insert.

3,724,814
ASSEMBLY OF A PALLET TOWING BRIDLE AND METHOD OF USE

Roger H. Walton, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 1, 1971, Ser. No. 203,693
Int. Cl. B66f *3/00*
U.S. Cl. 254—133 **10 Claims**

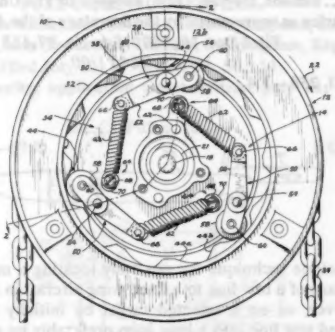


An aircraft cargo pallet-towing bridle in which a framework assembly, incorporating a front body portion, a rear nose portion and an elongated tube rigidly interconnected therebetween, pivotally mounts a rear pawl member and a front latch member each independently movable between retracted and extended positions in respective locking engagement with oppositely-disposed side lip portions on the pellet to be towed.

3,724,815
HOIST OPERATING HAND WHEEL INCORPORATING AN OVERLOAD PROTECTION MECHANISM

Harold V. Hawkins; Ralph A. Dick, both of Williamsville, and Alfred M. Parslow, Tonawanda, all of N.Y., assignors to Columbus KcKinnon Corporation, Tonawanda, N.Y.

Filed June 3, 1971, Ser. No. 149,705
Int. Cl. B66d *1/00*
U.S. Cl. 254—169 **5 Claims**

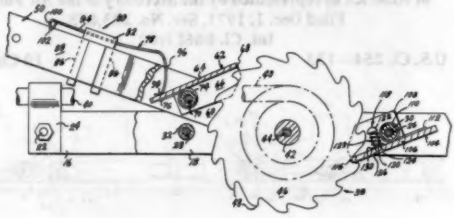


A hoist operating hand wheel including concentric hub and rim portions; the hub portion pivotally supporting three dog-leg shaped arms carrying rollers normally biased by adjustable tension springs into engagement with roller receiving recesses formed in a radially inwardly facing surface of the rim portion. When an attempt is made to raise a load in excess of desired hoist capacity, the rollers are forced to ride out of their associated recesses against the return bias of the tension springs, thereby permitting rotation of the rim portion relative to the hub portion. A single removable cover plate carried by the hub portion affords access for adjusting the tension springs and normally retains the arms and rim portion in assembled position on the hub portion.

3,724,816
ECONOMY HOIST

Robert L. Cain, West Lafayette, Ind., and James S. Rothrock, Des Plaines, Ill., assignors to The American Gage & Manufacturing Co., Wauseon, Ohio

Filed March 1, 1971, Ser. No. 122,756
Int. Cl. A63b 61/04
U.S. Cl. 254—164 4 Claims

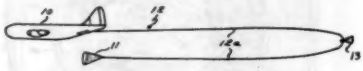


A hoist or power unit characterized by its economy of construction utilizing a symmetrically formed frame including spaced elements at the central region thereof between which a rotatable ratchet drum is mounted having a tension member wound thereon. The lever arm upon which the ratchet catch is mounted, the catch, drum ratchet pawl and frame are all constructed of sheet metal, and the configuration of the components is such as to produce high strength with a minimum of material and a substantially uniform distribution of forces within the hoist during tensioning of the tension member. Catch and pawl operating components are of a simplified nature, the catch release being linearally shifted in the release direction and including a leaf spring whose influence is overcome during release of the drum by an abutment mounted upon the pawl.

3,724,817
LONG LINE LOITER TECHNIQUE

John C. Simons, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 10, 1970, Ser. No. 97,413
Int. Cl. B64d 1/00
U.S. Cl. 258—1.4 5 Claims



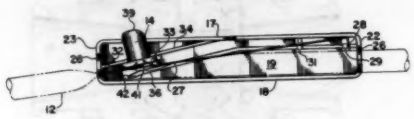
A unique technique for remotely locating a mass tethered by means of a tow-line to a fixed wing aircraft in a loiter position over, or on a selected target by initially forming the tethered tow line into a long loop preferably by use of a high drag device, while the mass is held within the aircraft, and subsequently free falling the mass from the aircraft to its remote, loiter position on target, while the aircraft is engaged in an onpylon circling maneuver to thereby stall the line.

3,724,818
VALVE CLAMP FOR ELASTICALLY DEFORMABLE TUBES

Albert J. Roger, 5200 E. 12th Street, Oakland, Calif.

Filed March 10, 1971, Ser. No. 122,779
Int. Cl. F16k 7/06
U.S. Cl. 251—9 4 Claims

A clamp for use with an elastically deformable tube to provide a valve therefor operative to selectively meter or stop the flow of fluid therethrough. The clamp includes an elongated hollow housing having openings in its opposite end walls defining a passageway through which such tube extends. An elongated leaf spring defining a valve element extends longitudinally within the housing along one side of the passageway and is normally biased outwardly therefrom toward a completely open position in which it does not appreciably deform or crimp the tube. A slide forming a control element is

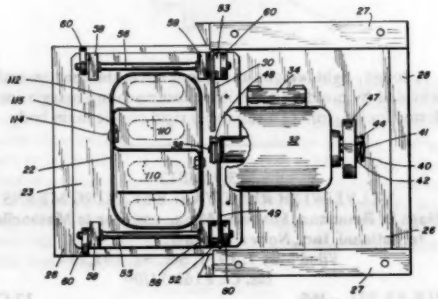


mounted within the housing for reciprocable longitudinal displacement generally along the spring through a path of movement which is angularly disposed with respect to the passageway and converges therewith in one direction. Movement of the slide in the direction toward the passageway forces the spring into engagement with any tube therein and causes the same to deform and thereby progressively restrict the fluid flow therethrough until complete stoppage occurs in the fully closed position of the spring.

3,724,819
APPARATUS AND METHOD FOR THE VIBRATORY FEEDING OF PULVERULENT AND GRANULAR MATERIALS

Gordon D. Varnum, and Charles D. Meylan, both of New Providence, N.J., assignors to Fred S. Garver, Menomonee Falls, Wis., by said Meylan

Filed Nov. 24, 1971, Ser. No. 201,742
Int. Cl. B01h 15/02
U.S. Cl. 259—29 12 Claims



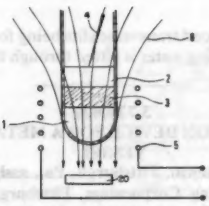
An apparatus and method are disclosed for the feeding of pulverulent and granular materials to and through defined apertures to receiving or collecting means. In particular, pulverulent or powdered material which has a tendency to pack in customary discharge chutes is caused to be vibrated in a hopper to a fluidized condition by apparatus in which two eccentrically weighted shafts are driven by a power train insuring that said shafts and eccentric weights are rotated at different speeds. Power is provided by a variable speed motor permitting the vibrations rate to be increased or decreased to accommodate or as required by the flow characteristics of the particular pulverulent material being discharged.

3,724,820

METHOD FOR BRINGING A NUMBER OF SUBSTANCES TOGETHER BY REMOTE CONTROL AND A DEVICE FOR CARRYING OUT SAID METHOD

Emmanuel Bonjour, Grenoble, and Michel Couach, Lyon, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed April 7, 1971, Ser. No. 131,866
Int. Cl. B01f *13/08, 3/20*; G01n *33/00*
U.S. Cl. 259—114 8 Claims



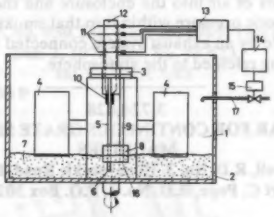
The substances to be brought together are placed in a vertical cell, at least that substance which is placed at the bottom of the cell being in the liquid state at the moment of contacting. A hydraulic seal consisting of a liquid having a density of higher value than the liquid-state density of the substance which is located immediately beneath said liquid is pierced by means of a perforator and caused to tilt downwards. The entire seal thus reaches the bottom of the cell and the reactants are thus brought together. The perforator is formed from magnetic material and set in motion as a result of the force produced by a magnetic induction gradient which is created by external means.

3,724,821

APPARATUS FOR AUTOMATIC REGULATION OF THE MOISTURE CONTENT OF GRANULAR MATERIAL

Franz Szatmari, and Max Wernli, both of Schaffhausen, Switzerland, assignors to George Fisher Aktiengesellschaft, Schaffhausen, Switzerland

Filed Dec. 1, 1971, Ser. No. 203,514
Int. Cl. B28c *7/04*
U.S. Cl. 259—149 15 Claims



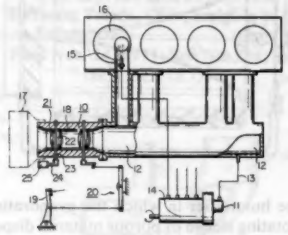
Apparatus for automatic regulation of the moisture content of granular material, such as molding sand, concrete, or the like, includes an elastically yieldable rod, one end of which is securely fixed and the other end of which extends into the granular material. The rod is moved relative to the granular material and a sensing means detects the amount of elastic deflection of the rod caused by the reaction thereof with the granular material during relative movement. The deflection of the rod is a function of the consistency of the granular material and the output of the sensing means is fed to a controllable valve to control the addition of moistening means to the granular material as a function of the elastic deflection of the rod. A plurality of rods may be provided.

3,724,822

INTAKE AIR CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE OF FUEL INJECTION TYPE

Shyuya Nambu, Yokohama, and Shigeo Aono, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama, Japan

Filed Oct. 2, 1970, Ser. No. 77,535
Claims priority, application Japan, Oct. 6, 1969, 44/79757
Int. Cl. F02m *69/00*
U.S. Cl. 261—43 1 Claim



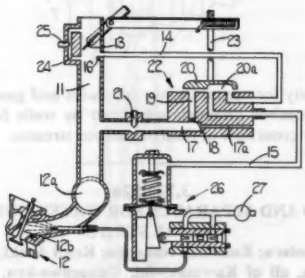
An intake air control device adapted for use in an internal combustion engine of fuel injection type. One embodiment comprises a butterfly type control valve provided in an intake air passage upstream or downstream of a throttle valve mounted therein. The control valve includes a flap member rotatable about a shaft secured thereto slightly off the center of the air passage. Thus, upon actuation of an acceleration control member, the control valve is opened by the flow of intake air after a predetermined time lapse from the moment the acceleration control member is actuated, thereby gradually increasing the amount of the intake air. Another embodiment employs a Venturi type piston valve to serve the same purposes.

3,724,823

FUEL INJECTION SYSTEMS

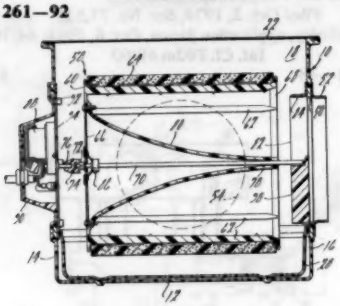
Herbert James Littlehales, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 13, 1970, Ser. No. 54,134
Claims priority, application Great Britain, July 21, 1969, 36,546/69
Int. Cl. F02m *3/00*
U.S. Cl. 261—69 R 8 Claims



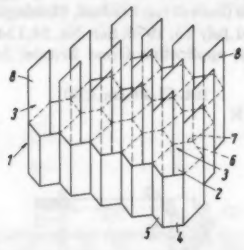
A fuel injection system for an engine has a metering unit controlled by one of a pair of pressure signals, the signals being selected by a valve arrangement so that when the engine throttle is shut, the signal applied to the metering unit has a predetermined value.

3,724,824
HUMIDIFIER
Stephen R. Mitich, Walled Lake, Mich., assignor to Masco Corporation, Taylor, Mich.
Filed Oct. 22, 1970, Ser. No. 82,966
Int. Cl. B01f 3/04
U.S. Cl. 261—92 **2 Claims**



A drum type humidifier in which the evaporating medium consists of a rotating sleeve of porous material disposed within a housing having an air inlet and an air outlet. The incoming air is directed by a diverter means at the air inlet into one end of the drum and passes through the evaporating material to the air outlet. An air distributing cone is disposed within the drum and has a large diameter end at the inner end of the drum and tapers to a smaller end disposed at the inlet end of the drum. The cone is shaped to control the air flow to cause a relatively uniform flow through all portions of the evaporating material, thereby greatly increasing the efficiency of the humidifier.

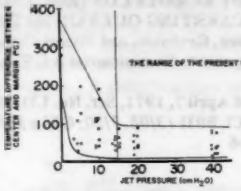
3,724,825
INSERT FOR TREATING FLUIDS AND GASES
Friedrich Streck, Bad Homburg, Germany, assignor to Rigips-Stempel GmbH & Co. KG, Dietzenbach, Germany
Filed Sept. 24, 1970, Ser. No. 75,108
Int. Cl. B01f 3/04
U.S. Cl. 261—95 **4 Claims**



Insert body for contact tower for fluids and gases comprising honeycombed channels separated by walls formed with recesses for cross flow of fluid or gaseous streams.

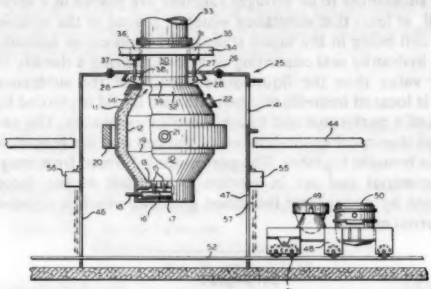
3,724,826
METHOD AND APPAPATUS FOR WATER QUENCHING METAL STRIPS
Haruo Kubotera; Kazuhide Nakaoka; Kenji Araki, and Takao Kurihara, all of Kawasaki-shi, Kanagawa-ken, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed July 1, 1971, Ser. No. 158,968
Claims priority, application Japan, July 3, 1970, 45/57977
Int. Cl. C21d 9/56
U.S. Cl. 266—3 R **6 Claims**

In a continuous annealing of low carbon steel strip, the said strip is water cooled to a temperature below 500° C at a position not immersed in water by jetting the quenching water from both sides at an impact pressure of 15 cm water. The apparatus comprises spaced nozzle plates between which the



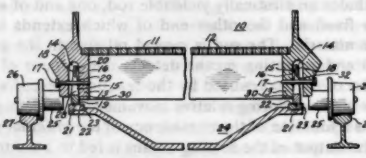
strip is passed, spaced transverse slits being formed in the nozzle plates. Quenching water is jetted through the slits.

3,724,827
ANTI-POLLUTION DEVICE FOR A METALLURGICAL VESSEL
Alexander T. Dortenzo, Pittsburgh, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.
Filed Oct. 20, 1971, Ser. No. 190,790
Int. Cl. C21c 5/38
U.S. Cl. 266—15 **9 Claims**



A vessel for converting molten ferrous metal to steel is mounted for pivoting about a horizontal axis and has bottom tuyeres which permit blowing of oxygen, other gases and powdered materials upwardly through molten metal inside of the vessel. A smoke hood is engaged with the open mouth of the vessel when it is untilted and is disengaged when the vessel is tilted for discharging or charging it. An enclosure at least partially surrounds the vessel. Devices for producing air curtains are situated adjacent certain openings in the enclosure to prevent influx of air into the enclosure and thereby maintain subatmospheric pressure within it so that smoke is drawn from the enclosure by an exhaust system connected to the hood instead of being released to the atmosphere.

3,724,828
SEALBAR FOR CONTINUOUS GRATE SINTERING MACHINES
Cyril Bradwell, R.D. No. 3, Honeysuckle Road, Bethlehem, Pa., and Robert C. Pope, R.D. No. 3, P.O. Box 302, Quakertown, Pa.
Filed Oct. 26, 1971, Ser. No. 192,407
Int. Cl. F27b 21/06
U.S. Cl. 266—21 **6 Claims**



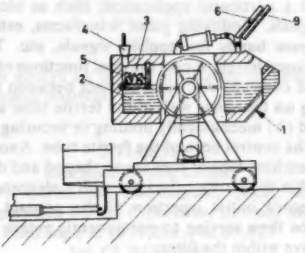
A sealbar for a continuous-grate type of sintering or pelletizing machine to improve and maintain an efficient seal between the sides of the moving pallets and windboxes.

3,724,829

APPARATUS FOR THE INTRODUCTION OF VOLATILE ADDITIVES INTO A MELT

Anton Alt, Mettmann, Germany, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Division of Ser. No. 793,065, Jan. 22, 1969, Pat. No. 3,666,449. This application Dec. 15, 1971, Ser. No. 208,074
Claims priority, application Switzerland, Jan. 26, 1968, 1274/68; Dec. 3, 1968, 17961/68
Int. Cl. C21c 7/00
U.S. Cl. 266—34 T 15 Claims



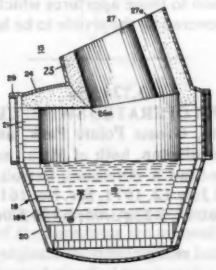
Introduction of vaporizable additives, such as magnesium, into an iron melt in which the vaporization is initiated by a tilting movement of a treatment vessel. The vaporizable material is contained in a separate compartment which can be externally charged and which, in one position of the vessel segregates the additive from the melt, but on tilting the vessel, permits communication with the melt through openings located at different levels. The vapor bubbles formed ascend through the melt with such a size and in such a number that at least a portion of the bubbles escape from the surface of the melt. The vapor bubbles have a great surface area to provide, for example with magnesium, a yield of at least 30 percent and preferably more than 40 percent of the additive in the melt while the velocity of the ascending vapor bubbles is such as to produce a flushing action on the melt resulting in a reduction of the reaction products and residual undesirable impurities in the melt.

3,724,830

MOLTEN METAL REACTOR VESSEL

Joseph M. Saccomano, and John D. Ellis, Jr., both of Fort Wayne, Ind., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

Division of Ser. No. 850,358, Aug. 15, 1969. This application Dec. 2, 1970, Ser. No. 94,623
Int. Cl. C21c 5/48
U.S. Cl. 266—36 P 2 Claims



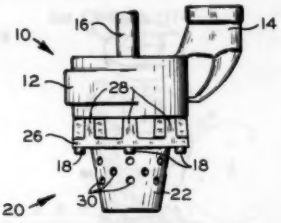
There is provided an improved reactor for the refining of molten metals, including an improved reaction vessel generally circular in cross section for holding a charge of molten metal, and having a lower side wall portion of the container sloping inwardly. A cover is provided on the container having edge areas projecting abruptly inwardly and having an elongated pouring spout radially inwardly of the edge areas. The reaction vessel is provided with an improved tuyere formed generally of concentric tubes of constant cross section so that the cross section of the tuyere remains constant as the tuyere erodes away with the erosion of the inner lining during successive heats of refined metal.

3,724,831

MOLTEN METAL STRAINER

Richard D. Huffman, Toledo, Ohio, assignor to Gerity-Schultz Corporation, Toledo, Ohio

Filed Nov. 24, 1971, Ser. No. 201,793
Int. Cl. C21b 7/14
U.S. Cl. 266—38 14 Claims



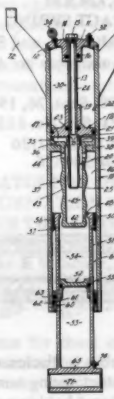
A shaped strainer for the inlet of a molten metal pump to be immersed in the molten metal reservoir of a metal furnace. The end of the strainer adjacent the pump inlet is spaced by bosses from the pump inlet to define a plurality of openings for the flow of molten metal from the reservoir to the pump. Additional apertures are provided in the main body of the strainer and function to militate against the passage of foreign matter, such as for example, dross, from entering the pump upon initial insertion of the pump into the furnace and during operation thereof.

3,724,832

OLEO-PNEUMATIC SHOCK ABSORBER

Frank Z. Ceska, Montreal, Canada, assignor to Menasco Manufacturing of Canada, Ltd., Quebec, Canada

Filed March 9, 1971, Ser. No. 122,421
Int. Cl. F16f 9/06
U.S. Cl. 267—64 R 12 Claims



A two-stage oleo-pneumatic shock absorber incorporating two pneumatic (air) pressure chambers, a high air pressure

chamber and a low pressure (air) chamber, separated by a hydraulic fluid (oil) pressure chamber. The oil chamber contains an orifice and metering pin, which orifice and metering pin control the rate of collapse of the low pressure air chamber. It also contains a second orifice and metering pin which control the rate of collapse of the high pressure air chamber. Both metering pins are preprogrammed so as to interact with each other and effect a nearly constant load throughout the stroke of the shock absorber, even under transient loading conditions.

3,724,833

REVERSIBLE ENERGY ABSORBING BUMPER SYSTEM

Dimitry B. Sergay, 427 Dorothy Drive, King of Prussia, Pa.

Filed March 12, 1971, Ser. No. 123,759
Int. Cl. F16f 7/00
U.S. Cl. 267—140 20 Claims

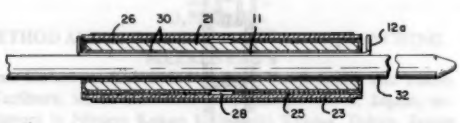
An energy absorbing, reusable and reversible system for absorbing substantially longitudinal impact forces and dissipating the impact energy therefrom. The bumper system includes an impact frame having pre-contoured rib members which are distended in a radial direction when the impact forces are applied to the system. A resilient sleeve surrounds the impact frame to absorb energy and force the rib members to their initial unloaded contour. Energy absorption is accomplished through a combination of loading the rib members into or near the plastic stress region and the resiliency of the surrounding sleeve.

3,724,834

CONTACT SPRING

Ferdinand William Schor, Altadena, and Rolland R. Roup, Alhambra, both of Calif., assignors to AMP Domestic Inc., Harrisburg, Pa.

Division of Ser. No. 861,299, Sept. 26, 1969. This application Feb. 8, 1971, Ser. No. 113,707
Int. Cl. F16c 1/26
U.S. Cl. 267—159 3 Claims



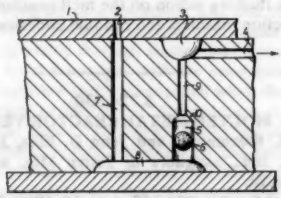
A filter connector assembly is disclosed which features an electrically conductive contact spring composed of beryllium copper or the like material and having a thin, elongated, and curved central portion of uniform cross-section together with latching tabs or lugs at each end of the central portion. These latching tabs are integral with the central portion of the spring and assume a bent-up position so as to be substantially perpendicular to the plane of the corresponding end part. The connector assembly includes a tubular shaped filter mounted in the assembly; a connector contact pin which is inserted in and may be removed from the central bore of the tubular filter and which may have an external lead connected thereto in any desired manner; and the aforementioned contact spring permanently retained or captivated within the tubular filter after its initial insertion therein. The filter itself takes the form of an inner ferrite tube and an outer ceramic tube closely surrounding the ferrite tube, with appropriately located conductive coatings applied to the surfaces of both tubes. The filter may be of any desired type to give whatever filtering effect is required in a particular application, such as blocking interference signals, modifying pulse waveforms, establishing or changing pass bands for applied signals, etc. The contact spring disclosed herein serves the dual functions of (a) making a stable and constant electrical contact between the conductive coating on the inner wall of the ferrite tube and the contact pin and (b) mechanically holding or securing the contact pin within the central bore of the ferrite tube. Another feature is that the latching tabs or lugs are so shaped and dimensioned as to fit within the ferrite tube bore with a clearance just sufficient to permit initial insertion of the contact spring, the latching tabs then serving to permanently retain the contact spring captive within the filter.

3,724,835

DEVICE FOR TEMPORARILY HOLDING ARTICLES OF DIFFERENT SIZES

Bernhard Gnoth, 7900 Ulm/Donau, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 26, 1970, Ser. No. 83,978
Claims priority, application Germany, Oct. 25, 1969, P 19 53 900.5
Int. Cl. B25b 11/00
U.S. Cl. 269—21 3 Claims



A device for temporarily holding articles of different sizes has a receiving surface with apertures therein connected by passages to a source of suction, means being provided for reducing the suction to those apertures which are not covered or insufficiently covered by the article to be held.

3,724,836

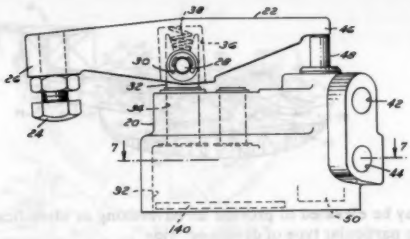
POWER OPERATED SWING CLAMP

Jack J. Sendoykas, Grosse Pointe Park, and Alexander W. McPherson, Farmington, both of Mich., assignors to Dover Corporation De-Sta-Co. (Division), Detroit, Mich.

Filed July 12, 1971, Ser. No. 161,474
Int. Cl. B23q 3/08; B25b 5/06
U.S. Cl. 269—32 11 Claims

A power operated swing clamp for clamping a work piece to a bed plate having a cam and bell crank mechanism for rotating the clamping arm into and out of operable clamping position. The cam is connected to the piston of the clamping cylinder thereby eliminating the need for separate power means to rotate the clamping arm into position prior to clamp-

ing actuation. The bell crank includes lost motion spring means to prevent damage to the clamp in the event that the



clamping arm strikes an object in its path of swing toward operable clamping position.

3,724,837

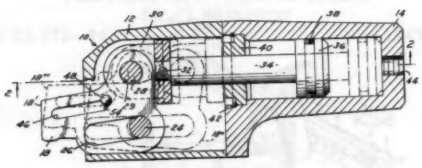
RETRACTING CLAMP

Alexander W. McPherson, Farmington, Mich., assignor to Dover Corporation De-Sta-C-Division, Detroit, Mich.

Filed Sept. 2, 1970, Ser. No. 69,013

Int. Cl. B23q *3/08*

U.S. Cl. 269—32 **5 Claims**



A retracting clamp for firmly holding work pieces on the bed of a machine tool or the like and incorporating a clamping arm which pivotally releases and linearly retracts inside the body guided by a ball detent in the body which engages a groove in the clamping arm.

3,724,838

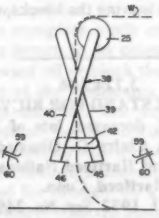
SHEET FOLDING APPARATUS AND METHOD

Vladimir W. Orlovsky, 691 High St., Bath, Maine

Filed July 31, 1970, Ser. No. 59,984

Int. Cl. B65h *45/20*

U.S. Cl. 270—79 **12 Claims**



In a semi-automatic sequence, paper sheets from a horizontal supply on top of the apparatus are manually advanced to a power-operated feed mechanism where each sheet is fed downwardly between a pair of vertical guides. While between these guides, the leading edge of each sheet engages a sensing switch to activate time delay means. The sheet continues to be fed between tucker or folder elements until a proper length of paper corresponding to the pre-established fold length has been fed past the tuckers. The time delay period is now terminated. Feeding of the sheet is interrupted and the vertical sheet is held by light tension at the start of the folding cycle. The automatic folding sequence continues until the trailing edge of the paper disengages the sensing switch, whereupon the tuckers cease to operate and resume a normal neutral position and the feed mechanism again becomes active for feeding the next sheet. The folded sheet drops onto a storage tray at the bottom of the apparatus for manual removal periodically.

3,724,839

COPY SHEET FEED TRAY RAISING AND LOWERING DEVICE FOR DUPLICATOR OR THE LIKE

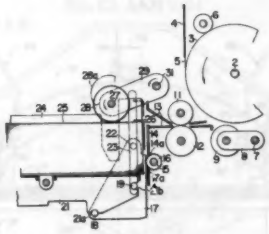
Minoru Suzuki, Yokohama, Japan, assignor to Ricoh Co. Ltd., Tokyo, Japan

Filed Dec. 20, 1971, Ser. No. 209,642

Claims priority, application Japan, Dec. 28, 1970, 45/129418

Int. Cl. B65h *1/14*

U.S. Cl. 271—39 **10 Claims**



A copy sheet feed tray operating device comprising an operation lever, pivotally supported by a side plate of the duplicating machine in which it is incorporated and movable from a first position to second and third positions, and suitable operating mechanisms whereby pivoting of the operation lever from the first position to the second position moves the copy sheet feed tray downwardly and the copy sheet feed roller upwardly, thereby permitting the placing of a predetermined number of copy sheets on the tray. Shifting of the operation lever from the second position to the third position moves the copy sheet feed tray upwardly so as to bring the top of a new stack of copy sheets on the tray into pressing engagement with the copy sheet feed roller. The force with which the copy sheet feed roller presses against the stack of copy sheets on the tray is automatically adjusted to an optimum level so that it is possible to feed each copy sheet under optimum conditions without requiring further adjustments. When the operation lever is released, it automatically returns to the first position.

3,724,840

STACKING APPARATUS FOR SHEET ARTICLES FED IN OVERLAPPING FORMATION ON A CONTINUOUSLY MOVING CONVEYOR TOWARDS A STACKING STATION

Gustav Kuckhermann, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

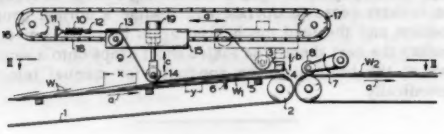
Filed April 29, 1971, Ser. No. 138,549

Int. Cl. B65h *29/66*

U.S. Cl. 271—46 **6 Claims**

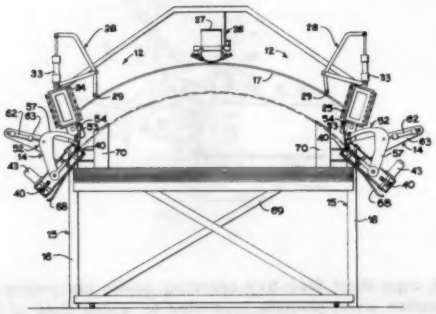
A stacking apparatus for sheet articles fed in overlapping formation on a continuously moving conveyor towards a stacking station, wherein the lowermost article of each intended stack is temporarily held stationary on the conveyor so that succeeding articles destined for the same stack bank up and their degree of overlap is increased before the lowermost article is released again. A braking device is progressively ap-

plied to the succeeding articles in an upstream direction at a speed so that their leading edges become held at uniform



spacings from one another and is released from all the articles when the lowermost article is also released.

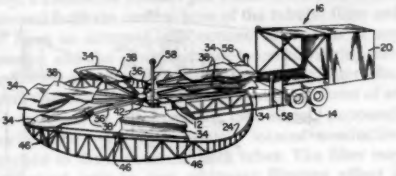
3,724,841
SHEET DISCHARGE MECHANISM
Leonard L. Hayes, Lewiston, Idaho, assignor to Potlatch Forests, Inc., San Francisco, Calif.
Filed Dec. 27, 1971, Ser. No. 212,112
Int. Cl. B65h *29/70*
U.S. Cl. 271—68 **7 Claims**



A conveyor discharge mechanism and method for receiving, controlling the motion of, and stacking self-supported sheets of resilient sheet material, particularly veneer. Plural discharge mechanisms are disposed successively at respective stacking stations along a longitudinal, continuously operating initial sheet material conveyor. The initial conveyor moves the sheets in an upward, self-supporting arched configuration. Each discharge mechanism is utilized to receive sheets of specific width. Each mechanism includes guides to maintain the arched configuration of each arched sheet as it falls from a release station. The guides direct the side edges of the sheet to edge engaging surfaces of the mechanism. The initial velocity of the sheet is reversed by the surfaces to move the sheet back to a stop. A discharge means is then activated to again release the sheet along guides to a flat vertical stack below.

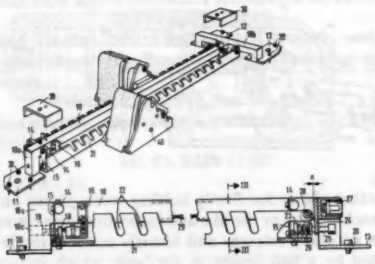
3,724,842
TRAILER MOUNTED ROUNDABOUT AMUSEMENT DEVICE
Gerald F. Wisdom, 337 Delaware, Sterling, Colo.
Filed Feb. 8, 1971, Ser. No. 113,326
Int. Cl. A63g *1/08, 1/34*
U.S. Cl. 272—29 **7 Claims**

Portable amusement device, commonly known as "Tilt-a-Whirl", characterized by a trailer forming operative and other parts of the device, including hoisting apparatus employed during assembly and disassembly. It is designed to stow the various parts on the trailer in compact manner to facilitate transportation thereof. After disconnecting the trailer from a tractor-type truck its frame is lowered to the ground, forming a rigid central support about which the device may rotate. An entrance compartment to the assembled device is utilized to stow parts of same and, when optionally employed, a pivoted box adjacent the entrance, also employed as storage space,



may be elevated to provide an advertizing or identification of the particular type of device or "ride".

3,724,843
STARTING CONTROL DEVICE FOR RUNNING EVENTS
Walter Fichter, Schiltach; Otto Armbruster, Hornberg, and Friedrich Assmus, Schramberg, all of Germany, assignors to Firma Gebruder Junghans GmbH, Schramberg, Germany
Filed Jan. 22, 1971, Ser. No. 108,719
Claims priority, application Germany, Jan. 28, 1970, P 20 03 845.3
Int. Cl. A63b *69/00*
U.S. Cl. 272—59 A **19 Claims**

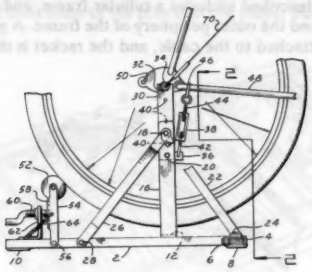


A track mountable starting control device for running events wherein a central rail is resiliently suspended from a stationary support rail. The support rail is detachably secured to the running track by the use of a spiked base. The central rail surrounds the support rail and has laterally formed apertures therein for receiving starting blocks. The starting blocks may be positioned in any of the apertures, on either side of the central rail, according to the requirements of the particular runner using the device. A contact device is provided on the support rail so that the movement of the central rail, which occurs when the runner is leaving the blocks, will signal the start of the event.

3,724,844
EXERCISE STAND FOR BICYCLES
Frederick S. Olmstead, deceased, late of 347 Williams St., Longmeadow, Mass.; Claire G. Olmsted, executrix, West Springfield, Mass., and Hartford National Bank and Trust Company, executor, Hartford, Conn.
Filed May 1, 1972, Ser. No. 249,415
Int. Cl. A63b *69/16, 23/04, 21/00*
U.S. Cl. 272—73 **1 Claim**

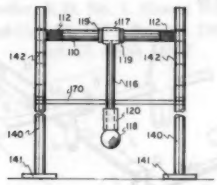
An exercise stand adjustable to accommodate standard size bicycles and pedalling in a stationary position. The base is T-shaped and has a U-shaped bracket with opposed upright arms seated on the leg of the base. Attached to the bracket are fore and aft angled braces supporting the arms. Vertical plates for rear axle support are anchored to and extend upwardly of the arms and carry at their lower ends turnbuckle-operated hook devices to releasably engage rear fork tube frame members of a bicycle and thereby clamp the wheel of the bicycle in an

elevated position. The plates can be mounted at selected elevations for different size bicycles. Mounted adjacent the



rear of the leg of the base is a lever carrying a tire presser roll to adjust resistance to pedalling.

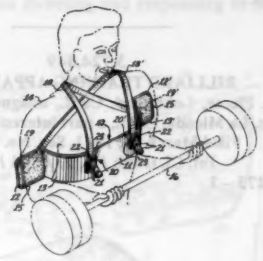
3,724,845
IMPACT RECEIVING EXERCISE DEVICE
James E. Irby, Route 3, Box 145, Spartanburg, S.C.
Filed March 18, 1971, Ser. No. 125,593
Int. Cl. A63b *69/20*
U.S. Cl. 272—76 **13 Claims**



A device is disclosed that is suitable for use in practicing karate and exercising in a limited space. The present exercise device comprises a horizontal member to which is attached a vertical member, wherein the vertical member has an impact member adjacent a lower end thereof and a cushioning member along its length. When kicked or otherwise struck by the user at the impact member, the vertical member will move upwardly making a complete circle or will be biased by a resilient element to return to its original position thus permitting the user to ward off or block the return of the vertical member by contact at the cushioning member or a further blow at the impact member. The vertical member moves around an axis defined by the horizontal member either through a pivotal connection with the horizontal member or in conjunction with the horizontal member when the horizontal member is journaled for rotation on a support frame or has gripping devices rotatably received thereon.

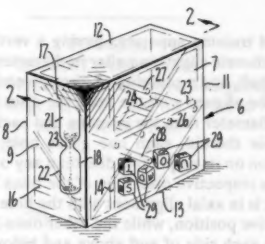
3,724,846
LIFTING YOKE AND HARNESS
Walter E. Perrine, P. O. Box 66, Navajo, Ariz.
Filed June 19, 1972, Ser. No. 264,145
Int. Cl. A63b *13/00*
U.S. Cl. 272—84 **5 Claims**

A weight lifting yoke supported by the shoulders of a human for positioning the biceps and triceps muscles of the arms in a substantially vertical position when the forearms assume a



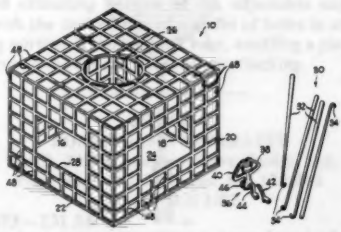
substantially horizontal position during a weight lifting operation.

3,724,847
DICE TUMBLING CHAMBER WITH TIMER
Donald M. Compton, P.O. Box 525, Aromas, Calif.
Filed Nov. 15, 1971, Ser. No. 198,730
Int. Cl. A63f *9/04*
U.S. Cl. 273—1 R **2 Claims**



A rectangular chamber having opposite planar walls has a timing glass in a vertical position at one end with a plurality of dice in the chamber. Each die has a letter of the alphabet on each face thereof. A plurality of bar members extend between opposite side walls of the chamber at different elevations. On reversing the chamber, the timer is actuated and the dice are tumbled by striking the bar members. As many words as possible as determined by the upturned faces of the dice are scored in the time alloted by the timing glass.

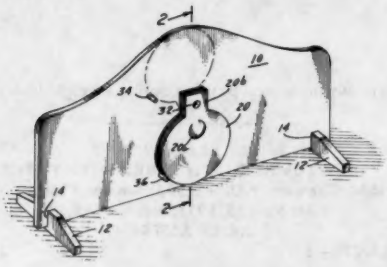
3,724,848
OPPOSING PULLING ACTION GAME
Marvin I. Glass, 815 North La Salle Street, and Jeffrey D. Breslow, 1819 West Thome, both of Chicago, Ill.
Filed Oct. 19, 1970, Ser. No. 81,924
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 R **1 Claim**



A generally cubic enclosure having foraminous side walls and top. A prize object is positioned in the enclosure and

players attempt to remove it from the enclosure in a tug-of-war type action by grasping it with members having yieldable hook ends.

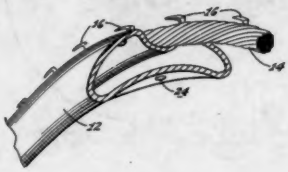
3,724,849
BILLIARD TRAINING APPARATUS
Louis D. Pierce, Lakewood, Calif., assignor to Ivey Franklin Mimbs, La Mirada, Calif., a part interest
Filed March 24, 1971, Ser. No. 127,552
Int. Cl. G09b *19/22*; A63d *15/00*
U.S. Cl. 273—2 **5 Claims**



Billiard training apparatus having a vertical panel, with an opening therein slightly smaller in diameter than the diameter of a cue ball, and a plurality of discs pivotally mounted on the panel to be aligned with the hole, the discs being of somewhat greater diameter than the opening and each disc having a cue guide hole therein, each cue guide hole having a different orientation on its respective disc than any other cue guide hole has on its respective disc. One of the discs has a central guide hole that is in axial alignment with the hole in the panel, when in operative position, while the other discs have holes, respectively, to each side of and above and below the center of the hole in the panel. The discs not in use are positioned out of the way of the hole in the panel, while each disc may be pivoted into alignment with the hole in the panel, so that the player uses the cue guide hole to practice a particular shot. The cue guide holes are adapted to slidably receive a forward end portion of a cue.

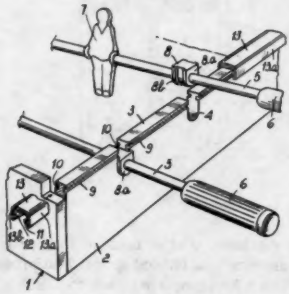
3,724,850
RACKET WITH STRING TENSION ADJUSTING MEANS
Robert Stevens, 16671 Greenview Lane, Huntington Beach, Calif.
Filed April 12, 1971, Ser. No. 133,305
Int. Cl. A63b *51/12*
U.S. Cl. 273—73 E **5 Claims**

An improved game racket is provided, for tennis and other games, which incorporates means for adjusting the strings of the racket so that they may always be maintained at proper tension when the racket is in use, thereby obviating the need for repeated re-stringing of the racket. When the racket is not in use, the tension may be relaxed. The embodiment of the invention to be described includes a tubular frame, and a cable extending around the outer periphery of the frame. A plurality of hooks are attached to the cable, and the racket is strung so



that the strings extend around the cables and beneath the hooks. The cable enters the interior of the frame at the base of the racket head and the ends of the cable extend down through the neck of the racket frame to the base of the handle. The cable ends are attached to either side of a bolt which extends through a metal plate and which is threaded through a nut. Adjustment of the nut provides the desired string tautness to the racket.

3,724,851
TABLE SOCCER OR FOOTBALL GAME STRUCTURE
Claudio Cecchetti, Via Verdi 50, Cernusco, Italy
Filed March 1, 1971, Ser. No. 119,692
Int. Cl. A63f *7/06*; F16c *35/02*
U.S. Cl. 273—85 D **1 Claim**

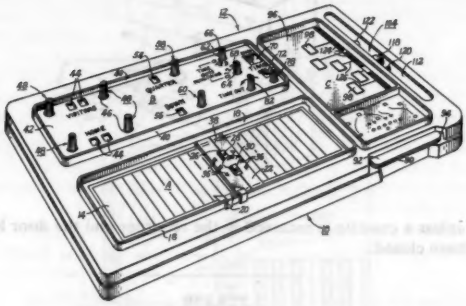


A table football or soccer game structure including a table with sides having an upper edge including seats therein providing slidable support for miniature dummy player carrying rods extending crosswise to the table. The rods are slidably received within bearing blocks insertable inside the seats and the bearing blocks are retained inside the seats by means of a strip member having a U-shaped cross section and slidably mounted astride of the upper edges of the sides. The strip member has internal longitudinal ribs for sliding engagement within longitudinal grooves provided on the side of the table.

3,724,852
PARLOR-TYPE FOOTBALL BOARD GAME AND ASSOCIATED APPARATUS
Calvin L. Payne, Jr., Hastings-on-Hudson, N.Y., assignor to Tudor Metal Products Corporation, Brooklyn, N.Y.
Filed Nov. 9, 1970, Ser. No. 87,804
Int. Cl. A63f *7/06*
U.S. Cl. 273—94 R **2 Claims**

The application discloses a parlor-type football board game with a simulated field and a simulated football positionable in

three selected locations across the field and longitudinally thereof in accordance with the throw of a spring-operated indicator relative to yards gained and lost markings represented on a preselected play card. Diagrams on the card afford a visual indication of the play that the player believes is most appropriate in accordance with his judgment and knowledge of football strategy. The card also functions on insertion adjacent the indicator to operate a minute and second timer varying according to the time which the selected play would normally require. A time out mechanism is arranged to disable the timer as provided by the rules of play.



3,724,853

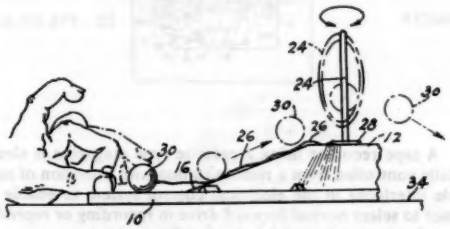
TETHERED PROJECTILE HAVING LOOP AND POCKETED TARGETS

William E. Crowder, R.D. No. 1, Mount Wolf, Pa.

Filed Oct. 18, 1971, Ser. No. 190,047

Int. Cl. A63b 71/02

U.S. Cl. 273—98 **10 Claims**



Game apparatus having an open-end ring target supported by a shaft in a central bearing within a base having peripheral score-indicating indicia thereon, and a flexible tether has a small ring connector on one end which moves freely around said open-end ring target and shaft thereof. A projectile on the other end of the tether is of smaller diameter than said open-end ring target and is adapted to be projected through said ring target and into scoring position relative to said score-indicating indicia.

3,724,854

LIGHT RESPONSIVE AND DIRECTING EXTRATERRESTRIAL VEHICLES

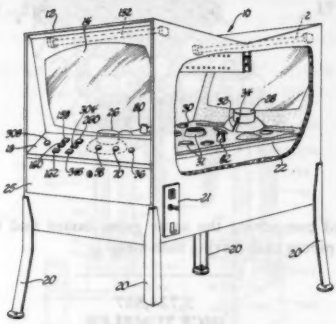
Howard A. Brooks, Ann Arbor, and Vernon J. Burzan, Dexter, both of Mich., assignors to Leisure-Tron Corporation, Ann Arbor, Mich.

Filed July 6, 1970, Ser. No. 52,531

Int. Cl. A63f 9/00

U.S. Cl. 273—101.1 **35 Claims**

An amusement device including an enclosed housing having viewing windows at each end, a simulated lunar surface extending longitudinally between the ends of the housing and operator-controlled movable objects in the shape of extraterrestrial vehicles for directing and responding to laser beams such that a laser beam duel may be simulated. A dramatic effect is introduced by causing the laser beam to sweep outwardly across the lunar surface to simulate the firing of the laser gun.



3,724,855

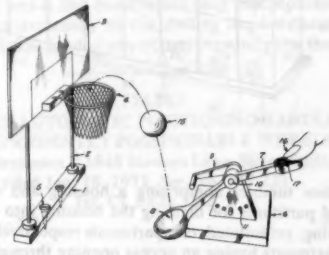
BASKETBALL GAME

Kwang Yup Chu, 14505 Cimarron Drive, Mesquite, Tex.

Filed Aug. 20, 1971, Ser. No. 173,568

Int. Cl. A63f 71/02

U.S. Cl. 273—101 **3 Claims**



A basketball game including a stand bearing a backboard and a net, a basketball, and a catapult. The ball fits in a cup at one end of the catapult lever. The lever pivots on a pin so that when one end of the lever is depressed the other end of the lever bearing the cup is elevated imparting upward and outward motion to the ball. An adjustable stop arm regulates the upward motion of the cup and hence the angle and height of motion of the ball, and the upward and downward position of the stop arm is adjusted by moving the arm so that a hole in a downward extending portion of the adjustable stop arm is aligned with the desired one of a series of holes in an upward extending portion of the catapult base, enabling a pin to be inserted through the aligned holes for interlocking.

3,724,856

BOARD GAME APPARATUS

Albert B. Welch, 3920 Centenary Drive, Dallas, Tex.

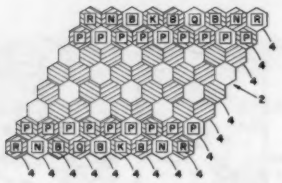
Filed March 17, 1971, Ser. No. 125,062

Int. Cl. A63f 3/02

U.S. Cl. 273—131 AB **6 Claims**

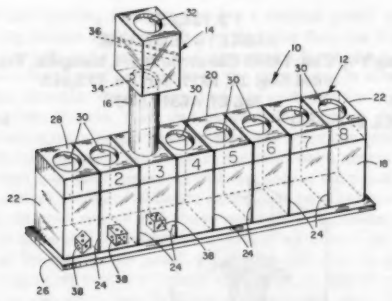
A chess-type game comprising a game board of generally parallellogram configuration having the three-color pattern shown in FIG. 1 and formed of an even number of rows each containing nine hexagonal playing spaces disposed in continu-

ous relation, and two sets of playing pieces each including three bishops and nine pawns. A checker-type game is also



disclosed comprising the same game board and two sets of playing pieces each having nine men.

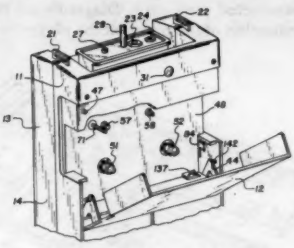
3,724,857
DICE TUMBLER
Albert J. Marino, 7818 12th Avenue, Brooklyn, N.Y.
Filed May 28, 1971, Ser. No. 148,095
Int. Cl. A63f *9/04*
U.S. Cl. 273—145 B **8 Claims**



A dice tumbler comprising a housing and a plurality of spaced partitions for dividing the housing into a plurality of adjoining, yet isolated, compartments respectively, each of the compartments having an access opening through which a die is insertable. The housing is generally transparent for permitting observation of die disposition. Associated with the housing is an auxiliary tumbler housing, the latter including a laterally extending member for initially altering, in abrupt fashion, the disposition of the die as the latter is in free-fall. The auxiliary tumbler housing may be detachably connected to each access opening of the compartments respectively in a successive manner so as to permit a plurality of dice to be successively cast into each of the compartments respectively.

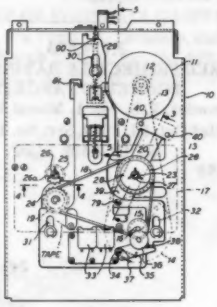
3,724,858
TAPE RECORDER APPARATUS
William A. Martin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 22, 1970, Ser. No. 57,264
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 **3 Claims**

A magnetic tape recorder for use in conjunction with a motion picture camera is provided with a compact portable housing having a door which may be opened to permit insertion of, or removal of, a tape cassette or cartridge. A cam mechanism operates in conjunction with the door whereby, when the door is opened, the record heads and a pressure roller which cooperates with the tape driving capstan are automatically withdrawn from their normal positions for easy removal or insertion of the cassette. The recorder is provided with an interlock system to prevent operation of an associated cine camera



unless a cassette is received in the recorder and the door has been closed.

3,724,859
CASSETTE MAGNETIC TAPE RECORDER
Richard Kobler, 6300 Zug, Switzerland; William F. Fagan, Rochelle Park, and Edward Feldman, Teaneck, both of N.J., assignors to McGraw-Edison Company, Elgin, Ill.
Filed Nov. 15, 1971, Ser. No. 198,875
Int. Cl. G11b *15/24*
U.S. Cl. 274—4 D **16 Claims**

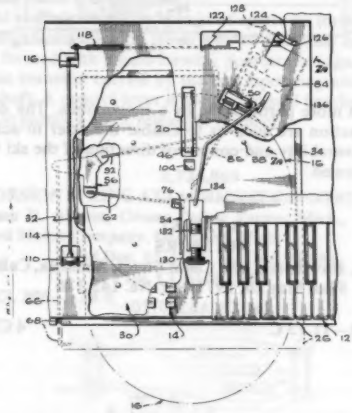


A tape recorder using a cassette type magazine is electrically controlled from a remote station with provision of suitable interlocks in the electrical control system to enable the user to select normal forward drive in recording or reproducing, fast (scan) rewind drive or fast-forward drive.

3,724,860
OPTICAL DISC DRIVE FOR ORGAN
John H. Northrop, La Canada; Eugene C. Jones, Long Beach; George W. Sioles, Palos Verdes Estates, and Gary W. Mellette, Hermosa Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 10, 1970, Ser. No. 96,813
Int. Cl. G11b *17/04, 1/00*
U.S. Cl. 274—9 B **8 Claims**

An electronic organ of a type that utilizes an optical disc record to generate sounds, which is constructed to allow rapid and easy installation and removal of disc records, including an organ housing with a doorway through which disc records can be installed and removed and a spindle for projecting through the central hole of the disc record to locate it while it revolves. The doorway opens to a pan with side walls and an end wall that are spaced from the spindle by distances slightly larger than the radius of the disc record, so that a record pushed in until it hits the rear wall and then released will automatically fall onto the tapered spindle. A door which can cover the

doorway, raises a record lifting member when the door is open to guide an inserted disc over the top of the spindle, and then lowers the record lifting member when the door is closed to allow the disc to fall onto the spindle. The disc is driven by a



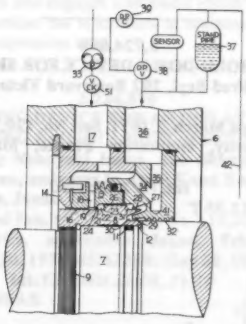
drive wheel which rotates on a movable axle, and a link coupled to the door deflects the axle when the door is opened to move the drive wheel away from a disc record. The movable axle also operates an on-off switch.

3,724,861

NEW TRAPPED BUSHING SEAL

Gerald Lesiecki, Greendale, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Oct. 27, 1970, Ser. No. 84,296
Int. Cl. F16j *15/16*
U.S. Cl. 277—25 **4 Claims**



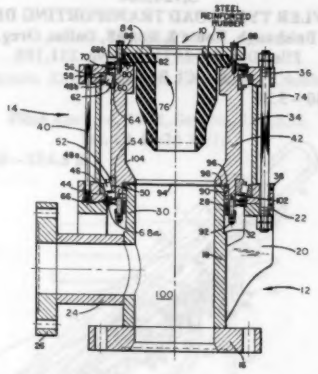
A rotary shaft seal is provided with a sealing fluid to seal a process fluid. The sealing fluid is admitted at a pressure just slightly higher than the pressure of the process fluid to provide a seal when the shaft is stationary and means are provided in the seal to increase this pressure as a function of rotation, with centrifugal force, to a sufficiently higher pressure than that of the process fluid pressure to prevent entrainment of the process fluid within the sealing fluid. A stable sealing fluid pressure decreasing means is provided in the seal which is also a function of rotation and which decreases the sealing fluid pressure with centrifugal force from the pressure in the high pressure area to the pressure of the process fluid at the process fluid-sealing fluid interface.

3,724,862

DRILL HEAD AND SEALING APPARATUS THEREFORE

Morris S. Biffle, P.O. Box 332, Vermilion, Ohio

Filed Aug. 26, 1971, Ser. No. 175,153
Int. Cl. F16j *15/16*; E21b *33/00*
U.S. Cl. 277—31 **17 Claims**



A drill head assembly for use in oil drilling operations in which there is provided a rotatable packing means for preventing abrasive well fluids or vapors from contacting the bearing surfaces of the rotatable portion of the drilling head and for preventing the escape of well fluids or vapors into the atmosphere. The packing means is constructed such that packing becomes tighter as the well pressure increases, thereby performing the function of a final control in the event of a blowout and is also constructed such that repacking may be performed externally to the drilling head without disassembly of the drill head or any of the rotatable parts therein.

3,724,863

CART WITH AUTOMATIC POSITIONING HANDLE AND INDEPENDENTLY POSITIONABLE WHEELS

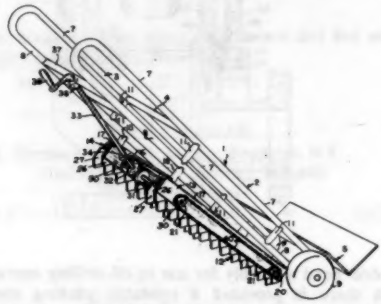
Rudolph Talamantez, 11548 Stewart Lane, Silver Spring, Md.

Filed Jan. 18, 1971, Ser. No. 107,221
Int. Cl. B62b *3/22*
U.S. Cl. 280—5.2 **3 Claims**

The disclosure relates to a cart or pick-up truck capable of transporting a load on level ground, hills and inclines and up stairways and the like wherein the operator thereof is capable of maintaining a constant erect position during operation, regardless of the contour of the terrain over which the cart is driven. The cart includes a frame having a rotatable upward handle portion, the handle portion being rotatable in a direction away from and toward the operator and having a stop when rotated in a direction toward the operator so that the rotatable portion of the handle is never rotated to the

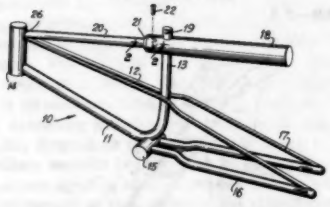
point where it is coaxial with the remaining portion of the frame. The cart also includes a pair of individually rotatable wheels, each wheel having a rotatable shaft whereby the wheels individually seek their own level, depending upon the terrain over which the cart is pulled or pushed.

3,724,864
CRAWLER TYPE LOAD TRANSPORTING DEVICE
Vernon L. Balsbaugh, Route 2, Box 68, Dallas, Oreg.
Filed Dec. 23, 1971, Ser. No. 211,188
Int. Cl. B62b *5/02*
U.S. Cl. 280—5.28 **1 Claim**



A combination hand truck and a manual or power driven propulsion unit including means for removably securing the propulsion unit to the body of the hand truck. The hand truck is of conventional type wherein the body is preferably, though not restrictively, made of metal tubing or the like, supported by two forward ground-engaging wheels.

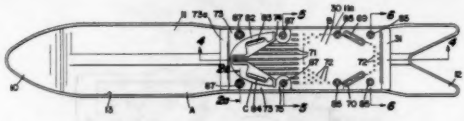
3,724,865
CONVERTIBLE BICYCLE
Martin Cristie, Brooklyn, N.Y., assignor to Stelber Industries Inc., Valley Stream, N.Y.
Filed Feb. 22, 1971, Ser. No. 117,604
Int. Cl. B62k *13/08*
U.S. Cl. 280—7.11 **6 Claims**



A bicycle which can be converted to a boys or girls bicycle design by means of a joiner unit providing for a removable horizontal tube between the seat support area and the head tube of the bicycle. The joiner unit preferably takes the form of a plastic bushing, adapted to receive a removable frame tube, which may be locked in place in the bushing element by means of a screw.

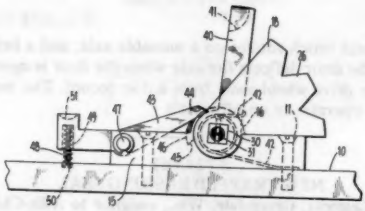
3,724,866
SKI ESPECIALLY ADAPTED FOR USE BY SKIERS TOWED BY A SNOWMOBILE OR THE LIKE
Irving Leonard Kaplan, Cleveland Heights, Ohio, assignor to Skijor Manufacturing Company, Cleveland, Ohio
Filed June 4, 1971, Ser. No. 150,034
Int. Cl. A63c *5/00*
U.S. Cl. 280—11.13 W **12 Claims**

A ski is provided which is of lightweight rugged construction, consisting of parts which are molded of suitable fiber-glass reinforced resins and easily and quickly assembled. The ski is so designed as to make it especially adapted for use in the sport of skijoring in which the skier is towed by a horse or



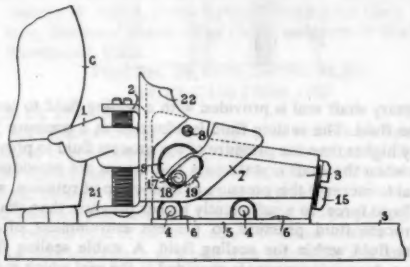
vehicle, and more particularly, by a snowmobile. The design and construction are such as to enable the skier to achieve easy maneuverability and control of direction of the ski while being thus towed.

3,724,867
SKI SPURS
Nathaniel F. Hawthorne, 855 Cedar Street, Alameda, Calif.
Filed May 20, 1971, Ser. No. 145,126
Int. Cl. A63c *7/10*
U.S. Cl. 280—11.13 C **4 Claims**



This invention relates to a ski spur, or non-skid device for skis which, in a retracted and non-operative position, lies on top of the respective skis; and in a projected and operative condition, provides spurs, or projections, which extend downwardly from the side of the ski to enable the wearer to climb icy or slippery slopes with extreme ease.

3,724,868
HEEL HOLD-DOWN DEVICE FOR SKI BOOT
Jean Joseph Alfred Beyl, 202 Boulevard Victor Hugo, Nevers, France
Filed March 2, 1971, Ser. No. 120,236
Claims priority, application France, March 5, 1970, 7007888
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **7 Claims**



This heel hold-down device for resiliently and releasably retaining the heel of a ski boot in a position of engagement with the ski surface comprises a resilient mechanism housed within the base member of the device and comprising a coil

compression spring acting upon a transverse rotary shaft carrying at either ends eccentric trunnions engaging cam elements provided on said pivoting jaw or on the supporting bracket thereof, the contour of said cam elements being such that when said shaft is locked in its operative position by said spring said gripping jaw is also retained in its normal, lower position, the upward movement of said jaw causing the rotation of said transverse rotary shaft about its axis against the resistance of the spring.

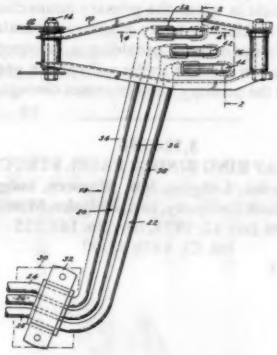
Said cam element may consist of apertures formed in a pair of flanges extending on either side of said base member and each formed with a cam-forming aperture engaged by an eccentric trunnion carried by the corresponding end of the rotary shaft. A control lever is secured to said bracket or to said shaft to permit a quick release of the heel.

3,724,869

TORSION SPRING ATTACHMENT CONSTRUCTION

William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1970, Ser. No. 99,861
Int. Cl. B60g *21/04*
U.S. Cl. 280—124 B **7 Claims**



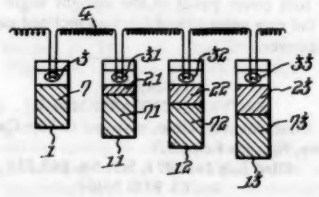
A torsion bar attachment construction in which a torsion bar has a hook-shaped end that passes through an aperture in a suspension arm and engages a recessed spring seat formed in the arm. The torsion bar is stressed to maintain it in engagement with the suspension arm.

3,724,870

GAS-PRODUCING DEVICE FOR AN INFLATABLE BODY-PROTECTING BAG ON A HIGH-SPEED VEHICLE

Isoa Kurokawa; Nobuyuki Izawa, and Shunji Orita, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 16, 1971, Ser. No. 115,332
Claims priority, application Japan, Feb. 18, 1970, 45/13458; May 20, 1970, 45/42388; May 20, 1970, 45/42389
Int. Cl. B60r *21/08, 21/10*
U.S. Cl. 280—150 AB **6 Claims**



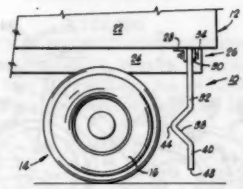
A gas-producing device is provided which includes a number of gas-producing tubes containing gas-producing composite material including an explosive and/or a combustible compound. The tubes, having different time durations of combustion are cooperable so as to inflate the body-protecting bag within at most 50 msec and to maintain it in its inflated state for a definite period of time, for example, 500 msec. The gas-producing device also includes improvements effective to stabilize the operation of the gas-producing tubes and the inflation of the body-protecting bag associated therewith.

3,724,871

MUD FLAPS

James P. Evans, 3233 Southwest 23rd Street, Oklahoma City, Okla.

Filed April 14, 1971, Ser. No. 133,832
Int. Cl. B62d *25/16*
U.S. Cl. 280—154.5 R **8 Claims**



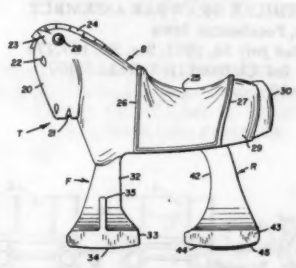
A mud flap device which is particularly adapted for use with truck trailers, the device consisting of a longitudinally reinforced guard member which includes securing means across the top edge thereof and, further, which is formed with a forwardly protruding portion for alignment generally with a vehicle tire such that the protruding portion of the guard member will maintain the lower portion of the guard member displaced by a predetermined amount from the tire.

3,724,872

WALKING TOY

Rudy R. Proctor, Arvada, and Denver L. Proctor, Wheat Ridge, both of Colo., assignors to Jet-X Corporation, Denver, Colo.

Filed Feb. 1, 1971, Ser. No. 111,487
Int. Cl. A63f *19/00*
U.S. Cl. 280—1.177 **5 Claims**



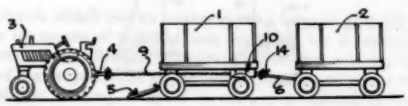
A walking toy for a child which may simulate a horse and which includes a body having a seat for the child which may simulate a saddle, with a front pedestal depending from the front of the body and a rear pedestal pivotally connected to the body at a pivot point underneath the seat, but extending rearwardly and downwardly to a laterally extended base under the rear of the body. The front pedestal also has a laterally extending base, and each base is longitudinally convex, so that the child may shift his weight forwardly onto the front pedestal to cause the rear pedestal to swing forwardly toward the front pedestal, and shift his weight rearwardly substantially upon the rear pedestal, to cause the front pedestal and body to

move forwardly and away from the rear pedestal. An accessory for the walking toy may be a flat board having a rear, depending strut, with a lower, concave notch to fit on the body just forwardly of the front rim of the saddle, and a pair of front, depending ears, each having a notch to fit upon a handle which extends from the opposite sides of the simulated horse head.

3,724,873
THREE-WHEELED VEHICLE
Stanley L. Glamb, deceased, late of Garden City, Mich., and by Robert V. Glamb, administrator, Ann Arbor, Mich., assignor to Helen D. Glamb, Widow, Garden City, Mich.
Filed March 26, 1971, Ser. No. 128,314
Int. Cl. B62k *27/02*
U.S. Cl. 280—203 **5 Claims**

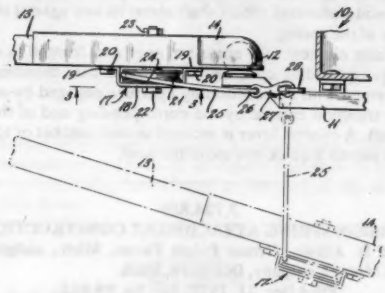
A vehicle having interchangeable and reversible parts with which it can be converted into a number of different types of vehicles. The parts of the vehicle include a frame, having a forked rear, a mounted fork at the front of the frame for rotational movement about a substantially vertical axis, to which is attached a front wheel, a handlebar attached to the fork, a seat attached to the frame, and an auxiliary seat assembly attached to the rear of the frame supported by a pair of rear wheels. The auxiliary seat assembly is reversible and removable.

3,724,874
VEHICLE DRAWBAR ASSEMBLY
Glenn Simpson, Pocahontas, Iowa
Filed July 30, 1971, Ser. No. 167,776
Int. Cl. B60d *1/18*; B62d *53/00*
U.S. Cl. 280—408 **4 Claims**



A drawbar assembly for hitching two trailers together is composed of the following combination: (1) a hollow, rectangular, drawbar receiver for attaching to the rear axle of the first trailer; (2) a portable drawbar attachable to the tongue of the second trailer and movable into the receiver; and (3) a flexible dragline attachable at one end to the drawbar, thence running through the receiver and under the first trailer and attachable at the other end to a tractor for pulling the drawbar into the receiver; the combination having stopping and locking means for holding the drawbar in the receiver.

3,724,875
SAFETY CABLE FOR TRAILER HITCH
Arnold R. Hillman, 25821 Telegraph Rd., Flat Rock, Mich.
Filed Dec. 30, 1971, Ser. No. 214,356
Int. Cl. B60d *1/12*
U.S. Cl. 280—457 **5 Claims**



Safety auxiliary apparatus for connecting a towed vehicle to a propelling vehicle in which the primary connection is a conventional trailer hitch. The safety auxiliary apparatus includes means on the trailer tongue providing a connection to the propelling vehicle so that the trailer will remain under control in the event that the primary hitch becomes disengaged.

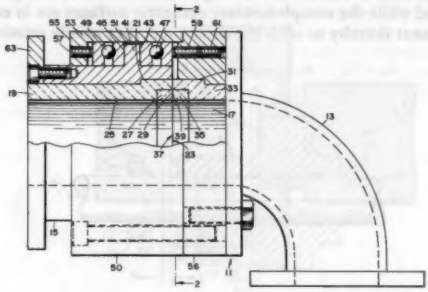
3,724,876
LOOSE LEAF RING BINDER EASEL STRUCTURE
Albert P. Krikorian, Longmeadow, Morocco, assignor to National Blank Book Company, Inc., Holyoke, Mass.
Filed July 12, 1971, Ser. No. 161,725
Int. Cl. A47b *23/00*
U.S. Cl. 281—33 **9 Claims**

Loose leaf ring binder easel structure having outer cover panels, an intermediate back cover panel pivotally hinged therebetween and ring wire sheet holding mechanism mounted on the back panel, one of the outer covers having an easel support secured thereto and extending from the inside cover surface for engaging the ring wires and holding the cover to an outer limit of pivotal movement at an oblique angular relation to the back panel, the second outer cover panel being free to swing into a back to back relation with the back cover panel. When the second cover panel rests on a platform surface the back panel is horizontal and the easel support holds the first cover panel at the upright angle for turning sheets on the ring wires to and from an inclined easel position against the cover.

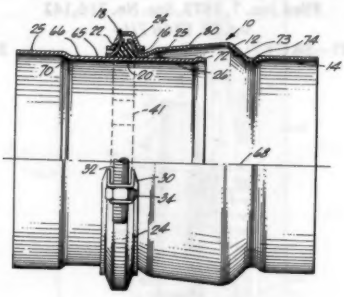
3,724,877
SWIVEL JOINT ASSEMBLY
Bruno H. Thut, Mentor, Ohio, assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed July 16, 1971, Ser. No. 163,226
Int. Cl. F16l *39/04*
U.S. Cl. 285—55 **9 Claims**

In a swivel joint assembly, a housing is rotatably mounted on an open end of a fixed tube. A passage within the housing

communicates with the tube for the flow of fluid. Both the passage of the housing and the tube are lined with an inorganic fiber. A ring seal supported in the passage engages another ring seal in the tube for sealing the junction between the tube and the passage.



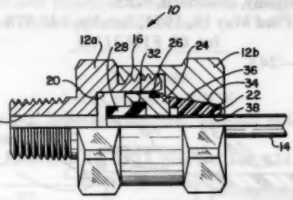
3,724,878
FLEXIBLE CONNECTOR
John A. Ford, 543 Landfair Avenue, Los Angeles, Calif.
Filed March 24, 1971, Ser. No. 127,601
Int. Cl. F16l *21/06*
U.S. Cl. 285—93 **7 Claims**



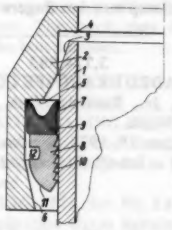
A connector for joining two hollow members intended for the transport of fluid and/or gas medium where axial, rotational and/or angular relative movement may be present between the hollow members. The connector includes a bell-housing member adapted for rigid attachment to one of the hollow members. The bell-housing member forms the desired flexible connection to the other hollow member by means of a gasket which is retained and pressed thereagainst by a gasket hood formed by the flared end of the bell-housing member, a retaining ring, and a clamping ring which surrounds the hood. The gasket is specially shaped to have desirable deformation and sealing characteristics.

3,724,879
TUBING COUPLING
Clifford H. Snyder, Jr., 103 Cherry Tree Place, Coraopolis, Pa.
Filed Nov. 22, 1971, Ser. No. 201,014
Int. Cl. F16l *17/00*
U.S. Cl. 285—101 **4 Claims**

A coupling is provided which sealingly connects a section of smooth cylindrical tubing to a fluid passage. The coupling includes a rigid housing with a deformable initial seal and a deformable secondary seal. The deformable secondary seal is frusto-conical in shape and abuts a frusto-conical surface within the housing. An annular piston is disposed within the housing in contact with the frusto-conical secondary seal. Line pressure directed against the piston by the initial seal causes the secondary seal to be deformed within the frusto-conical chamber of the housing to thereby tightly grip the outer surface of the tubing.

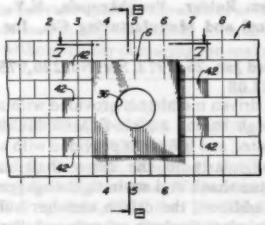


3,724,880
THRUST SAFETY IN SOCKET CONNECTIONS OF PIPES
Georg Seiler, Pachmayrplatz 11, Munich, Germany
Filed May 20, 1971, Ser. No. 145,328
Claims priority, application Germany, July 10, 1970, P 20 34 325.3
Int. Cl. F16l *17/02*
U.S. Cl. 285—105 **15 Claims**



The invention relates to a thrust safety in socket connections of pipes, in particular pressure pipes, for the supply networks of cities or the like, made of malleable iron or plastic, with a sealing ring to seal the gap between the socket and the pipe end, the inside surface of the socket tapering down slightly under a predetermined inclination towards the socket end and serving to receive a clamping ring.

3,724,881
PRESSURE VESSEL WITH CONNECTOR FITTING
Alexander Zeitlin, 18 Macy Avenue, White Plains, N.Y.
Filed Feb. 18, 1972, Ser. No. 227,471
Int. Cl. E04h *7/02*; F16l *41/00*
U.S. Cl. 52—192 **10 Claims**

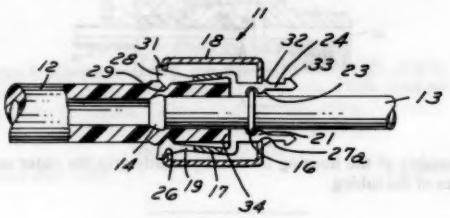


A segmented high pressure vessel has a special connector fitting incorporated in its peripheral wall for connecting a pipe thereto.

3,724,882
TUBE-TO-HOSE CONNECTION

David C. Dehar, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 10, 1971, Ser. No. 141,878
Int. Cl. F16l 21/06
U.S. Cl. 285—243 6 Claims

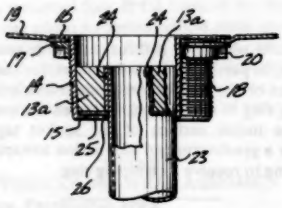


A nonthreaded coupler for connecting a flexible hose to a relatively rigid tube or nipple. The coupler includes an inner sleeve or clamp member positioned about and secured to the tube near its end. The clamp member has a plurality of axially extending fingers that form a cage to receive the end of the hose. An outer sleeve, positioned about the inner sleeve, is axially movable relative to and engagable with the inner sleeve to constrict the opening of the cage and to compress the hose wall between the clamp member fingers and the tube.

3,724,883
PRELEADED DRAINPIPE CONNECTOR

John M. Dennis, Jr., Renton, Wash., assignor to Charles Shane, Renton, Wash.

Filed Jan. 18, 1971, Ser. No. 107,339
Int. Cl. F16l 13/00
U.S. Cl. 285—291 4 Claims



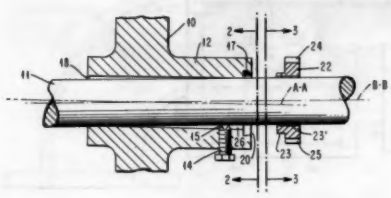
A lead caulking collar adapted to seat in a drainfitting thimble is precast around an adaptor or stub for connection to a drainpipe.

3,724,884
DRIVEN MEMBER LOCKING DEVICE

Richard Harden Roider, Poughkeepsie, N.Y., assignor to Lundquist Tool and Manufacturing Co., Inc., Worcester, Mass.

Filed Jan. 26, 1972, Ser. No. 220,975
U.S. Cl. 287—52.08 3 Claims

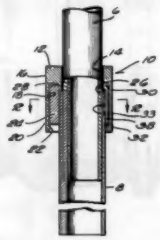
The hub of a driven member is provided with a longitudinal bore therethrough having a slide fit with the drive shaft on which it is mounted and is further provided with a set screw arranged perpendicularly to the drive shaft and having a hardened serrated shank end set in tight engagement with the drive shaft. In addition, the driven member hub is provided with an eccentric counterbore at one end thereof and the counter bore is undercut to form a sharp edge. The device also includes a locking ring or collar that is likewise provided with a bore therethrough having a slide fit to the drive shaft. The collar also has an eccentric shoulder formed on an end face thereof, the shoulder being complementary to the eccentric counterbore in the hub and receivable therein. The collar is also provided with means through which the collar may be rotated while the complementary eccentric surfaces are in engagement thereby to rock the driven member axially relative to the drive shaft and drive the set screw serrations into the body of the drive shaft. While the collar is being rotated, the sharp edge formed by the undercutting of the hub eccentric bore cuts a crude thread form in the surface of the collar's eccentric shoulder thus firmly securing the shoulder within the hub counterbore.



3,724,885
LOCKING DEVICE FOR EXTENSIBLE TUBES

Gordon D. Becker, Rt. 1, Larsen, Wis.

Filed Jan. 7, 1972, Ser. No. 216,142
Int. Cl. F16b 7/14
U.S. Cl. 287—58 CT 2 Claims



Elastomeric annular parts preferably made of synthetic resin such as nylon include at least two sleeves which are eccentrically interlocked and relatively rotatable to develop torque which effects lateral binding pressure to lock together telescopically associated tubes engaged with such parts, whereby two tubes may be fixed in different over-all lengths.

The same principle is applied in an alternative embodiment to tubes which have annular collars to effect the lock but are themselves square or rectangular in cross section.

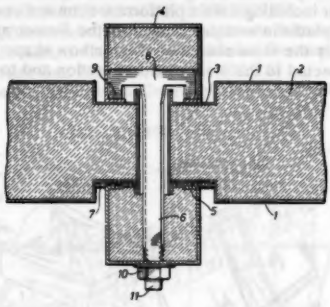
3,724,886
JOINT BETWEEN FIREPROOF AND PRESSURETIGHT WALL AND CEILING ELEMENTS

Lennart Widerby, Jonkoping, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed May 14, 1971, Ser. No. 143,555
Int. Cl. F16b 5/02
U.S. Cl. 287—189.36 D 1 Claim

A joint between fireproof and pressuretight elements consisting of sheet metal covers enclosing an insulating filler and having U-shaped slots at their joining ends and being joined together by two U-shaped clamping sections pressed against the slots by bolts, which are T-shaped and flat, the head of which resting against the inside of the outer section and being

somewhat wider than said section internally, whereby the bolt can be inserted from the inside of said elements and during the

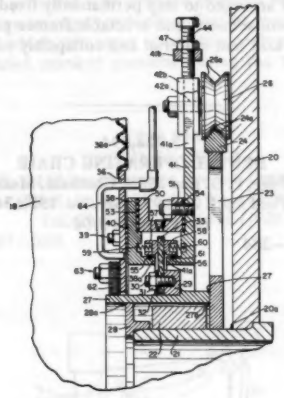


screwing-on of a nut on the bolt be brought into contact with the inner walls of the section.

3,724,887
KILN SEAL

Edward S. Roberts, New York, N.Y., assignor to Treadwell Corporation, New York, N.Y.

Filed May 18, 1971, Ser. No. 144,461
Int. Cl. F27b *7/24*
U.S. Cl. 287—189.36 **6 Claims**

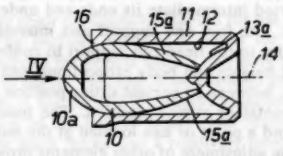


An end seal for a rotary kiln having axial-reference centering means.

3,724,888
SPRING-BIASED LATCHING DETENT

Michael Joseph James, Cheltenham, England, assignor to Micro & Precision Mouldings (Cheltenham) Limited, Cheltenham, England

Filed March 24, 1971, Ser. No. 127,641
Claims priority, application Great Britain, March 24, 1970, 14058/70
Int. Cl. E05c *19/02*
U.S. Cl. 292—74 **3 Claims**

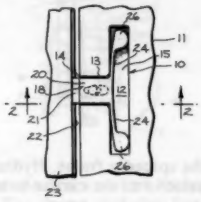


An assembly such as a door catch has two relatively movable members, one of the members having a projecting resilient arm and the other having a ramp-like surface along which the arm travels. The result is that the resilient arm deflects during relative movement of the members in one direction and the flexing of the arm produces a return force acting between the members and in the opposite direction.

3,724,889
LATCHING DEVICE

Eddie W. Dooley, Jeffersonville, Ind., assignor to General Electric Company

Filed Oct. 12, 1971, Ser. No. 188,124
Int. Cl. E05c *1/10*
U.S. Cl. 292—87 **5 Claims**

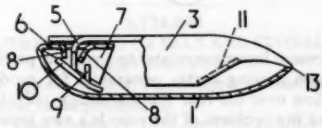


A one-piece self biasing plastic latch member for retaining a movable closure member to a stationary member having a bolt member with integrally formed flexible arms adapted to bias the bolt member to an operative position for engagement by the stationary member. The latch may include a handle formed integral with the bolt member.

3,724,890
SECURITY SEALING DEVICE

Donald Adamson, Warlingham, and Frank Henry Arthur, Chelsfield, both of England, assignors to Envopak Limited, Sidcup, Kent, England

Filed April 26, 1971, Ser. No. 137,214
Claims priority, application Great Britain, April 27, 1970, 20,145/70
Int. Cl. B65d *33/34, 55/06*
U.S. Cl. 292—322 **2 Claims**



An improved security sealing device comprises a pair of hingedly connected metal jaws of which one has a tongue insertable through a slot in the other. The slot has inward facing lips while the tongue has catch tabs which, after insertion of the tongue through the slot, move to positions on opposite sides of the tongue such that by engagement with the lips of the slot they thereafter prevent opening movement of the jaws. By this arrangement it is virtually impossible to manipulate the jaw locking parts without visibly damaging the sealing device.

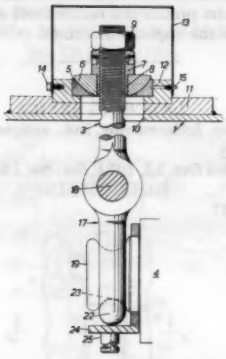
3,724,891
SUSPENSION MEANS FOR LOAD HANDLING EQUIPMENT

Terence Brickley, Cannock, England, assignor to Rubery, Owen & Co., Limited, Darlaston, Wednesbury, England

Filed April 14, 1971, Ser. No. 133,893
Claims priority, application Great Britain, April 21, 1970, 18,906/70
Int. Cl. B66c *5/02*
U.S. Cl. 294—67 R **3 Claims**

A freight container is handled by a crane or carrier by means of a spreader frame engaging with the container. The

spreader frame is suspended from the carrier by vertical links which can swivel relative to the carrier and can be easily



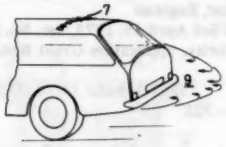
detached from the spreader frame. Hydraulic jacks move the spreader frame relative to the carrier to align it with the container.

3,724,892

VEHICLE, ESPECIALLY A STATION WAGON, HAVING A VORTEX GENERATOR FOR PRODUCING AN ATTACHED FLOW OVER THE REAR WINDOW

Georg Sven-Olof Ridder, Fregattvagen 12, Lidingo, and Hans Goran Lorinder, Vattentornsvagen 1, Osterskar, both of Sweden

Filed Feb. 8, 1971, Ser. No. 113,239
Claims priority, application Sweden, Feb. 17, 1970, 2014/70
Int. Cl. B62d *35/00*
U.S. Cl. 296—1 S **3 Claims**



The present invention relates to a vehicle, particularly a station wagon, having vortex generators for producing an attached flow over the rear window and/or tailgate in order to overcome the problem of the vehicle's own tires throwing up slush which quickly covers the rear section of the vehicle, and the front part of vehicles following behind, with a layer of dirt. The vortex generators are designed to reduce the boundary layer of the air flow along the vehicle's rearward roof surface, gently curved shoulder surface and an obliquely slanted first surface so that separation is prevented over these surfaces and so that an attached flow can be maintained over same. In this way, the turbulent recirculation flow (base flow) will occur only outside of and downstream of a vertical second boundary surface. The vortex generators are a row of substantially rectangular sheets substantially perpendicular to the vehicle roof surface and disposed in pairs that are rearwardly alternately inclined with each sheet forming an angle of no more than 30° with the longitudinal direction of the vehicle.

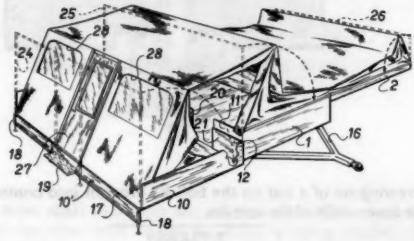
3,724,893

FOLDABLE TENT CAMPING UNIT

Pierre R. Giroux, 3156 de Francheville St., Three Rivers, Quebec, Canada

Filed Sept. 13, 1971, Ser. No. 179,972
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 R **15 Claims**

A foldable tent camping unit particularly conceived for making a tent trailer, arranged when unfolded to cover about three times the ground surface covered by the same when folded, and using a convenient linkage and spring arrangement to produce spring assisted folding and unfolding. A tent trailer including a main platform section and one or two extension platform sections hinged to the former and of approximately the same size thereof, an elbow shape lever pivotally connected to the main platform section and to a correspond-



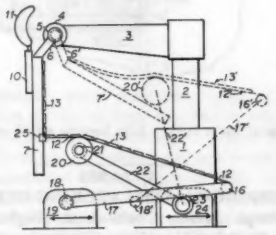
ing extension platform section to pivot with the latter and a spring counteracting the weight of the corresponding extension platform section to assist folding and unfolding thereof. A tent material arranged to stay permanently fixed peripherally to the platform sections and erectable frames pivoted to the latter under said tent material and collapsibly supporting the latter.

3,724,894

DENTAL OPERATING CHAIR

Richard W. Page, P. O. Box 258B, Chatham, Mass.

Filed April 20, 1971, Ser. No. 135,634
Int. Cl. A47c *3/00*
U.S. Cl. 297—284 **9 Claims**



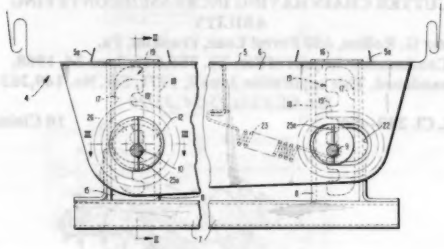
The dental chair has a longitudinally flexible webbing slung between supports at its ends for supporting the patient and also supported intermediate its ends and under the knees of the patient. The foot end support and intermediate support adjust relative to the head end support to conform to patients of different heights and body proportions, and also to adjust for attitude, between an upright sitting position and a substantially horizontal or supine position. The head end support pivots around a point or axis located at the mouth of the patient and the adjustment of other elements provides for pivoting around this axis. The head end pivotal axis is vertically adjustable to accommodate different working positions for the dentist.

3,724,895

MECHANISM FOR ADJUSTING THE HEIGHT OF SEATS, ESPECIALLY OF MOTOR VEHICLES

Oskar Brand, Darmsheim, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 26, 1971, Ser. No. 192,527
Claims priority, application Germany, Oct. 31, 1970, P 20 53 665.6
Int. Cl. A49b *1/00*
U.S. Cl. 297—348 16 Claims



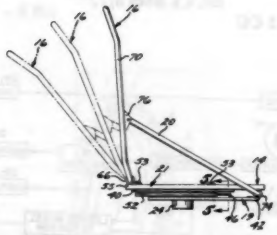
An installation for adjusting the inclination and height of a seat, especially of a motor vehicle seat, supported on a shaft which itself is supported in two side walls secured at the seat; the shaft is provided with cranked portions which engage in toothed rows arranged mutually offset as regards the height thereof, of which two serve alternately as bearing means for the associated cranked portions during the rotation of the shaft.

3,724,896

RECLINER CHAIR

Earl H. Belk, 2438 San Francisco Avenue, Long Beach, Calif.

Filed Oct. 4, 1971, Ser. No. 185,941
Int. Cl. B60n *1/02*; A47c *1/026*
U.S. Cl. 297—369 4 Claims



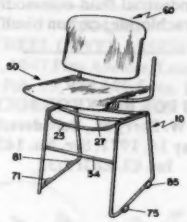
A recliner chair particularly adapted for use in recreational vehicles. The recliner includes a mount for attachment to fixed structure of the vehicle and for rotatably mounting a bottom frame to permit the chair to be swiveled about a generally vertical axis. A back frame is pivotally mounted to a relatively fixed portion of the bottom frame, and braces are attached between the back frame and a relatively movable portion of the bottom frame. A seat lock mechanism locks the fixed and movable portions of the bottom frame in any position of recline or tilt of the back frame to prevent movement of the seat back during a vehicle accident or the like.

3,724,897

WIRE ROD CHAIR

Frederick S. Faiks, Comstock Park, and Randall P. Buhk, Wyoming, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Feb. 1, 1971, Ser. No. 111,429
Int. Cl. A47c *1/12*
U.S. Cl. 297—446 15 Claims



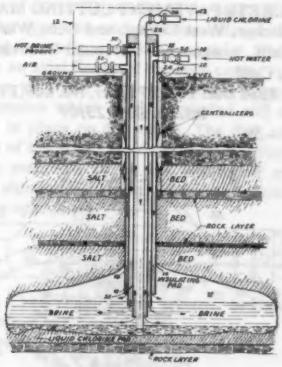
The specification discloses a chair having a seat, back and wire rod frame. The frame includes five wire rods and a stretcher welded together to provide an integral seat support, leg assembly and back support. Three of the five rods are welded together in endwise abutment to provide the frame with a continuous, uninterrupted appearance. The two wire rods at the rear extend upwardly forming rear legs, then diverge inwardly along the rear of the seat. They meet and extend upwardly together, rigidly joined to form an upright portion. The rods then diverge outwardly and upwardly to provide a U-shaped back support. The seat includes downwardly depending tabs at either side which mate with flanges on the sides of the seat support portion of the frame. The front of the seat comprises a lip which curls over a front rod of the seat support. The chair rests on four glides, all of which have fastening intelligence such that the chairs of this invention can be ganged together. The glides on one runner have facing fastening intelligence while those on the other runner have fastening intelligence facing away from one another, such that fore and aft and lateral movements of joined chairs are eliminated.

3,724,898

SOLUTION MINING OF SALT AND STORAGE OF INDUSTRIAL FLUIDS

Charles H. Jacoby, Dalton, Pa., assignor to International Salt Company, Clarks Summit, Pa.

Filed March 29, 1971, Ser. No. 128,768
Int. Cl. E21b *43/28*
U.S. Cl. 299—5 12 Claims



A system for solution mining a salt deposit and simultaneously storing an industrial fluid, while conserving system heat

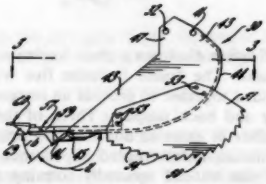
input and minimizing earth surface polluting impurity extractions from an underground salt deposit. The invention provides an improved method for conserving system input heat, and utilizing it to improve a solution mining operation in an underground salt mineral deposit; whereby to produce a purified brine at reduced cost. The majority of the mineral deposit impurities are left underground, thereby reducing the recovery plant earth surface polluting effluent problem. Incidentally, the system provides an improved underground storage system for industrial fluid commodities such as liquid chlorine; carbon tetrachloride; carbon bisulfide, and the like.

3,724,899

TOOTH FOR BACKHOE BUCKET

Harry C. Clark, 226 W. Perry St., Belvidere, Ill.

Filed May 14, 1971, Ser. No. 143,388
Int. Cl. E02f *3/32*
U.S. Cl. 299—26 8 Claims



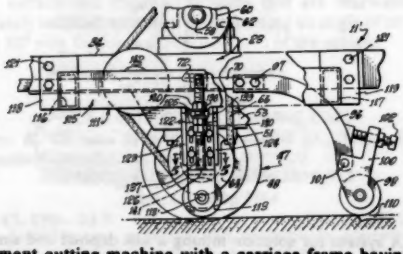
A backhoe type excavator includes a digging bucket adapted to dig through frozen earth, limestone and the like by the operation of the normal actuators of the excavator. Detachable saws are mounted on the two side panels of the bucket to cut through the frozen earth during back and forth movement of the bucket. A ripper tooth on the lower lip of the bucket then is pulled across the earth between the two resulting cuts or kerfs to break loose the frozen earth, and the tooth thereby coacts with the saws to excavate an initial hole of predetermined size through the frost line. As the initial hole is enlarged to form a trench or the like, new kerfs are cut in the frozen earth at the edge of the initial hole and the tooth is driven in between the lower ends of the kerfs to break loose a relatively large chunk of frozen earth which thereby falls into the bucket for subsequent removal. To facilitate digging through limestone, the ripper tooth extends forwardly of the lower lip at a substantial angle inclined relative to a row of teeth fixed to the lip. When digging, the bucket is drawn repeatedly across the surface of the limestone with the tooth and teeth on successive passes alternately positioned to dig into and rip loose the limestone to form the trench.

3,724,900

CONCRETE PAVEMENT CUTTING MACHINE

Cecil W. Hatcher, West Covina, and Gene Warner, Whittier, both of Calif., assignors to Pavement Grooving Ideas, Ltd., Pasadena, Calif.

Filed Dec. 17, 1971, Ser. No. 209,118
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 7 Claims



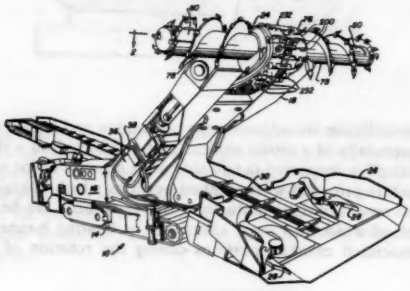
Pavement cutting machine with a carriage frame having a cutter for cutting grooves in a pavement. The carriage frame has front wheels in front of the cutter and rear wheels at the rear of the cutter, an auxiliary wheel being provided with a support which retains the bottom of its periphery above and out of contact with the pavement in the absence of an abrupt drop in the level of the pavement. The auxiliary wheel contacts the pavement to limit the depth of cut of the cutter when the wheel in front of the cutter encounters an abrupt drop in the level of the pavement.

3,724,901

CUTTER CHAIN HAVING INCREASED CONVEYING ABILITY

Lester G. Rollins, 650 Forest Lane, Franklin, Pa.

Continuation-in-part of Ser. No. 786,649, June 24, 1968, abandoned. This application June 2, 1971, Ser. No. 149,263
Int. Cl. E21c *25/34, 35/20*
U.S. Cl. 299—84 10 Claims



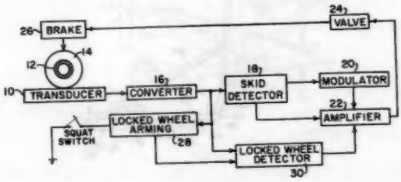
A cutter chain and support means therefor and more particularly a mining apparatus cutter chain having a plurality of lug portions integral with links of such a cutter chain for substantially increasing the conveying ability of the chain over the natural conveying ability thereof.

3,724,902

SKID DETECTOR CIRCUIT

Edgar J. Ruof, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 13, 1970, Ser. No. 36,936
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 CG 3 Claims



A skid detecting circuit for use in a brake control system which has two outputs, the first of which is produced whenever a slight skid occurs and is applied to the modulator section of the brake control circuit to provide a slight reduction in brake pressure. The second output is produced only when a major skid occurs and is applied directly to the amplifier of the brake valve control circuit to cause rapid dumping of the brake pressure. The circuit employs a pair of amplifiers connected in a balanced bridge network. One of the amplifiers is connected to a more sensitive point in the network and is thus responsive to any skid signal. The second amplifier is responsive only to skid indicating signals above a certain higher magnitude.

3,724,903

ANTI-SKID CONTROL SYSTEM FOR VEHICLES

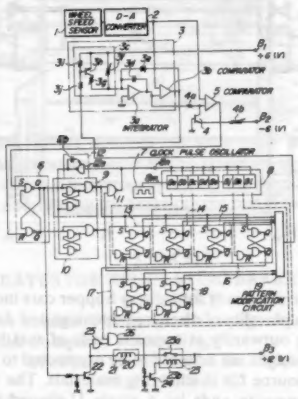
Atsutoshi Okamoto, Toyohashi, and Akio Sugiura, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan

Filed Sept. 29, 1971, Ser. No. 184,671

Claims priority, application Japan, Nov. 16, 1970, 45/100935

Int. Cl. B60t 8/08

U.S. Cl. 303—21 P 1 Claim



An anti-skid control system for vehicles, wherein a plurality of timer circuits comprise a counter circuit for counting clock pulses having a fixed frequency and a plurality of flip-flop circuits for detecting predetermined finite time durations from the output signals of the counter circuit.

3,724,904

WHEEL BALANCING DEVICE

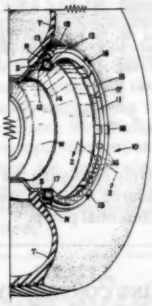
Charles Roy Nixon, and Anton Gasafi, both of Downsview, Ontario, Canada, assignors to Charles Roy Nixon, Downsview, Ontario, Canada

Filed March 8, 1971, Ser. No. 121,739

Claims priority, application Canada, March 26, 1970, 078470

Int. Cl. B60b 13/00

U.S. Cl. 301—5 BA 3 Claims



An annular tube of rectangular cross-section, extruded into a predetermined shape corresponding to the interior profile of the vehicle wheel rim, and further comprising a plurality of movable weights in the shape of cylindrical discs or rollers of somewhat reduced cross-sectional dimension in relation to the interior cross-section of the tube so as to roll freely therearound, and a certain predetermined quantity of damping liquid such as oil or the like to damp the movement of the weights. A number of attachment clips are spaced around the annular tube so as to both fasten the same firmly into position in the vehicle wheel, and also to locate the same in a predetermined location spaced from the vehicle wheel rim so as to hold the tube out of contact with the rim. The design and shape of the tube is such that it is possessed of very great inherent resistance to distortion, and the wear on the interior of the tube is greatly reduced by the use of cylindrical rollers as opposed to spherical balls.

3,724,905

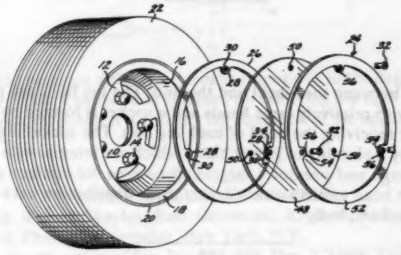
WHEEL COVER ASSEMBLY

Robert S. Kachler, 1047 Pine Avenue, Long Beach, Calif.

Filed Feb. 19, 1971, Ser. No. 116,902

Int. Cl. B60b 7/06

U.S. Cl. 301—37 P 3 Claims



A wheel cover assembly for mounting to a wheel structure of the type which includes a tire rim which circumscribes the central lug nut area of the wheel. The wheel assembly includes a flat circular wheel cover made of transparent plastic material which overlies the central lug nut area of the wheel and affords a means for inspection of the lug nut area, the wheel cover being removably secured in position by cooperating fastener and mounting means. The transparent wheel cover is particularly suited for use with sculptured or decorative aluminum alloy or magnesium wheels, and the wheel cover may be tinted to further enhance the decorative appearance of the wheel.

3,724,906

WHEEL COVER

Raymond A. McCarroll, 1725 Newcastle, Grosse Pointe Woods, Mich.

Filed Jan. 25, 1972, Ser. No. 220,630

Int. Cl. B60b 7/06

U.S. Cl. 301—37 R 13 Claims

A vehicle wheel cover disposed over the side of a wheel having a drop center type rim, said cover including a disk portion with an axially inwardly extending annular flange that is telescoped into an axial flange of the drop center rim. The annular flange has mounted thereon a radially expansible and contractible annulus which when expanded will center and lock the cover in place on the wheel. The disk and annular flange portions of the cover are formed by molding of plastic or non-ferrous materials or by die casting of non-ferrous metals such as aluminum and zinc alloys, or ferrous alloys by suitable forming operations.

3,724,907

WHEEL HUB

John R. Housel, Cherryvale, Kans., assignor to Hensel-Miller, Inc., Cherryvale, Kans.

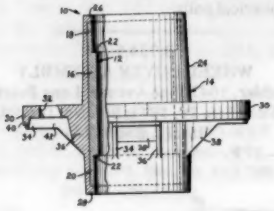
Filed Feb. 17, 1971, Ser. No. 116,074

Int. Cl. B60b 27/02

U.S. Cl. 301—105 R 3 Claims

A hub for mounting a wheel on an axle utilizes a steel sleeve for forming an axle bushing and a bearing housing. The steel

sleeve is surrounded by an aluminum casting which forms the remainder of the hub and includes a circumscribing flange for securing a wheel. A plurality of openings in the hub flange receive lug bolts for fastening the wheel. The openings in the wheel hub are of polygonal configuration for receiving complementally configured shafts of the lug bolts to distribute



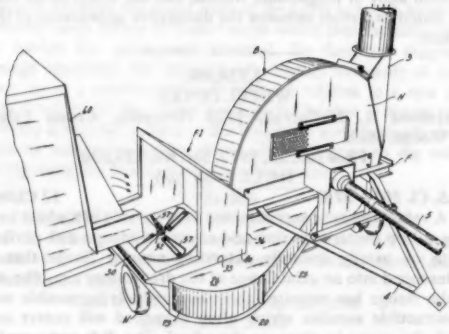
torque between the wheel and the hub. The lug bolts are provided with relatively large heads and a socket is formed by the hub for receiving the head of each lug bolt. The socket is provided by a plurality of gusset plates which are integral with the hub flange and present a large surface area for contact with the bolt head to further maximize torque distribution between the wheel and hub.

3,724,908

FEED MATERIAL HANDLING APPARATUS

Donald E. Burrough; David R. Scheffler, and Dean E. Seefeld, all of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.

Filed Oct. 22, 1971, Ser. No. 191,946
Int. Cl. B65g *53/40*
U.S. Cl. 302—37 **8 Claims**



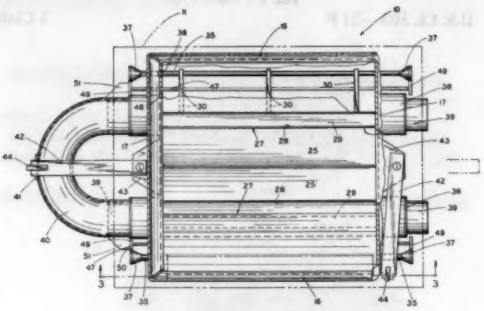
A material handling apparatus for handling silage, for example, and blowing it upwardly into the top of a silo. The apparatus includes a vertically disposed blower having a single rotor which, with the casing of the blower, defines two separate compartments, each of which are fed separately from opposite sides of the blower. The rotor of the blower has paddles for each of the compartments, the paddles for one of the compartments being staggered circumferentially in respect to the paddles in the other compartment. The apparatus also includes novel feeding means for the blower which comprises a pair of whirling horizontal rotors that evenly distribute the material to opposite sides of the blower.

3,724,909

DISCHARGE ARRANGEMENT FOR RAILWAY HOPPER CARS

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Transport Leasing Company, Chicago, Ill.

Filed Dec. 13, 1971, Ser. No. 207,505
Int. Cl. B65g *53/40*
U.S. Cl. 302—52 **10 Claims**



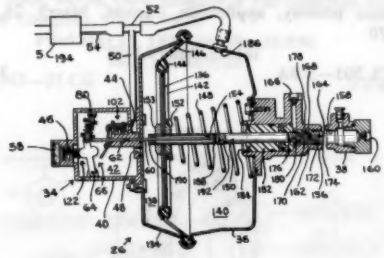
A discharge arrangement for railway hopper cars includes a housing having a plurality of discharge openings and discharge troughs opening outwardly at opposite ends of said housing. The discharge troughs are adapted to be connected to a suitable pneumatic source for discharging materials. The troughs are closed at opposite ends by a single U-shaped conduit which communicates with the adjacent ends of the trough, each of the U-shaped conduits being removable from one side of a railway car for attachment to a pneumatic discharge arrangement.

3,724,910

CAM OPERATED CONTROL

Louis P. Rossigno, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Sept. 29, 1971, Ser. No. 184,768
Int. Cl. B60t *13/50*
U.S. Cl. 303—12 **10 Claims**



A control for positively regulating the alternate flow of partial vacuum from a source of air at atmospheric pressure to operate a pressure differential pump.

3,724,911

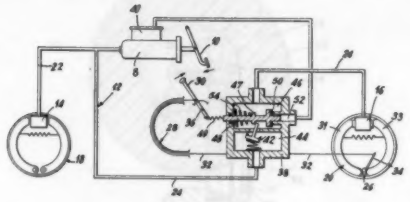
BRAKING CONTROL SYSTEM

Gerard Chevreux, Bois-Colombes, France, assignor to Societe Anonyme D.B.A., Clichy, France

Filed July 24, 1970, Ser. No. 62,001
Claims priority, application France, Aug. 1, 1969, 6926486
Int. Cl. B60t *15/16*
U.S. Cl. 303—13 **4 Claims**

A vehicle braking system is disclosed in which the brakes are hydraulically actuated by the conventional master cylinder

and optionally may be mechanically actuated by the usual lever arrangement. A valve is disposed in the fluid conduit interconnecting the master cylinder and the brake and the master cylinder reservoir. The valve is responsive to actuation



of the mechanical actuator to shift from a first position preventing communication to the reservoir to a second position preventing communication from the master cylinder into the valve and venting the brakes to the reservoir.

3,724,912

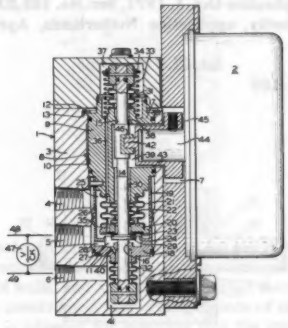
APPARATUS FOR REGULATING BRAKE CONTROL PRESSURE

Richard F. Balukin, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jan. 25, 1972, Ser. No. 220,620

Int. Cl. B60t *15/08*

U.S. Cl. 303—16 **6 Claims**



Apparatus for use with vehicle electro-pneumatic brake systems, said apparatus being characterized by a friction-free self-lapping valve device responsive to opposing control forces reflecting the degree of electrical dynamic braking and the degree of fluid pressure controlling the pneumatic friction braking for automatically maintaining the called-for overall braking effect of the dynamic and friction braking combined, said valve device being operable responsively to variation of dynamic braking effort for automatically maintaining the called-for electro-pneumatic braking relationship by compensatingly varying the degree of delivery fluid pressure for the pneumatic braking system.

3,724,913

ELECTRODYNAMIC SELF-LAPPING VALVE

Jose Levy, Paris, France, assignor to Compagnie des Freins et Signaux Westinghouse, Freinville-Sevran, France

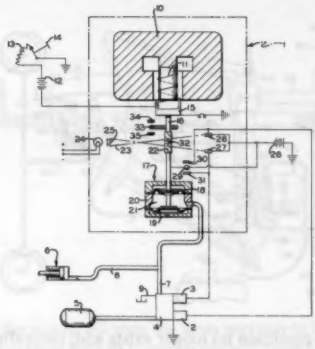
Filed March 18, 1971, Ser. No. 125,627

Claims priority, application France, March 26, 1970, 7011014

Int. Cl. B60t *15/02, 13/68*

U.S. Cl. 303—20 **7 Claims**

Electrodynamic self-lapping valve apparatus for controlling supply and release of fluid pressure for a fluid pressure operable device by electromagnetically selectively positioning a light shield between a source of light and a selected one of a plurality of light responsive sensors, said apparatus also in-



cluding pressure differential means responsive to the degree of fluid pressure supplied or released for restoring the light shield to a neutral position to effect a lap condition of the apparatus.

3,724,914

ANTI-LOCK BRAKE SYSTEMS

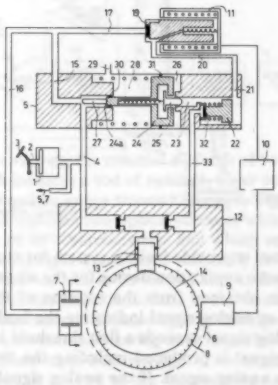
Derek Robert Skoyles, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 881,460, Dec. 2, 1969. This application Jan. 5, 1972, Ser. No. 215,622

Claims priority, application Great Britain, Dec. 13, 1968, 59,524/68

Int. Cl. B60t *8/02*

U.S. Cl. 303—21 F **14 Claims**



An anti-lock brake system having a wheel speed sensor and related electrical control unit for energizing a solenoid valve to divert brake fluid to a reservoir in response to wheel deceleration in excess of a predetermined value. The diverted fluid displaces a plunger and restrictor member attached thereto; the restrictor being extended into a section of the pressure line to restrict flow therethrough.

3,724,915

HYDRAULIC PRESSURE MODULATOR

Stanley Irving MacDuff, Magdalen Islands, Quebec, Canada, assignor to The Bendix Corporation, South Bend, Ind.

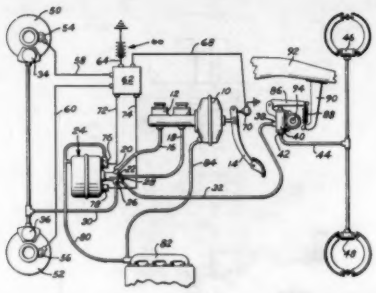
Division of Ser. No. 763,742, Sept. 30, 1968, Pat. No. 3,556,609. This application Sept. 16, 1970, Ser. No. 72,738

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **12 Claims**

An anti-skid braking system which includes a modulator for controlling communication between the master cylinder and

the brakes. The modulator allows normal communication until a skid condition is sensed. Upon sensing the skid condition, the modulator releases fluid pressure from the brakes



until the skid condition no longer exists and, thereafter, reapplies the fluid pressure to the brakes. This cycle is repeated as many times as the skid condition is sensed.

3,724,916

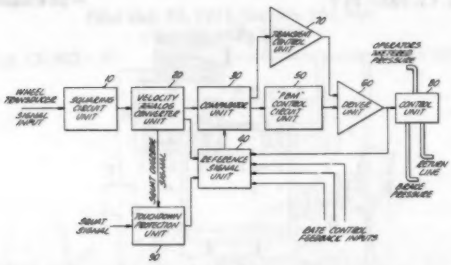
CONTROLLED WHEEL BRAKING SYSTEM

Edgar A. Hirzel, Granada Hills, Calif., assignor to Crane Co., Chicago, Ill.

Division of Ser. No. 871,439, Oct. 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 665,072, Sept. 1, 1967, abandoned. This application June 21, 1971, Ser. No. 154,990

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 BE **17 Claims**



A brake control is provided with a system for modifying the action of the brake application device for the wheel of a vehicle. Information obtained from the rotation of the wheel is used to derive an analog signal indicating the braking condition. If the analog signal exceeds a first threshold level, a first brake control signal is produced including the time integral function of the analog signal. If the analog signal exceeds a second threshold level, which is greater than the first threshold level, a second brake control signal is produced. The second brake control signal is substantially a linear function of the analog signal. The first and second brake control signals are continuously summed to produce a composite brake control signal for modifying the level of brake pressure exerted by the brake application device. The system also may include a lag compensating for summation with the first and second brake control signals in forming the composite brake control signal.

3,724,917

PILLOW BLOCKS AND FLANGE CARTRIDGES

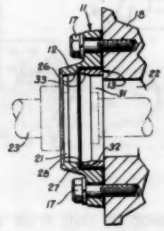
Pete Pakulak, 290 9th Street, San Francisco, Calif.

Filed April 26, 1971, Ser. No. 137,149

Int. Cl. F16c *23/00*, *43/06*

U.S. Cl. 308—72 **4 Claims**

Self adjusting ball bearing support housings of two sections exemplified in pillow blocks and flange cartridges. Each of said sections comprises complementary inner spherical seats for the reception of the spherical outer race of a supported bearing, and an inner shoulder on one of said sections defining



an annular space between the two sections to accomodate the self adjustment of the other section in relation to said one section and the self seating of the other section in relation to the outer race of a supported bearing.

3,724,918

BEARING

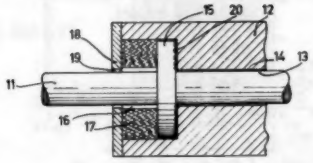
Jacobus Pieter Reinhoudt, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 23,303, March 27, 1970, abandoned. This application Oct. 1, 1971, Ser. No. 185,838

Claims priority, application Netherlands, April 5, 1969, 6905357

Int. Cl. F16c *33/66*

U.S. Cl. 308—109 **7 Claims**



A bearing comprising a shaft and a bush one of which forms a rotatable bearing member. A chamber for a lubricant is situated in the rotatable bearing member and the lubricant is forced to the bearing gap under the influence of centrifugal force. The part of the storage chamber facing the center line of the shaft is in open communication with the outside of the bearing so as to prevent negative pressure in the storage chamber when lubricant is transported to the bearing gap.

3,724,919

LOW FRICTION SEAWATER LUBRICATED BEARING JOURNAL ARRANGEMENT

Paul Lagally, and Robert P. Nagy, both of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy

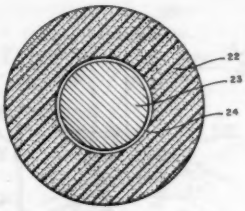
Continuation-in-part of Ser. No. 6,186, Jan. 27, 1970, abandoned. This application Dec. 28, 1971, Ser. No. 213,212

Int. Cl. F16c *33/20*

U.S. Cl. 308—238 **4 Claims**

A new type of low friction bearing-journal arrangement which can be lubricated by seawater wherein the rubbing sur-

face of a titanium journal in combination with a high density of polyethylene bearing is protected against scuffing or galling



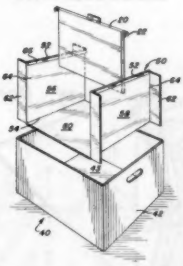
by a small concentration of iodine which may be absorbed at the bearing surface or be present as a water-soluble iodine salt or complex.

3,724,920

STORAGE BOX FOR STORING HANGING FILE FOLDERS

Robert E. Beck, Chicago, Ill., assignor to Follower Manufacturing Company, Franklin Park, Ill.

Filed March 17, 1971, Ser. No. 125,146
Int. Cl. B65d *5/58, 85/00*
U.S. Cl. 312—184 **7 Claims**



There is disclosed an insert structure for use in combination with a conventional storage box having a first pair of walls, a second pair of walls, and a bottom connected thereto. The insert means is constructed from a single piece of stiff, foldable material and is adapted for insertion into the storage box to enable the storage of at least one hanging file folder. The insert means has a pair of parallel edges and a pair of folds parallel to the pair of parallel edges. The folds segment the insert means into three sections, whereby the first and second sections are adapted to form a plane parallel to the first pair of walls of the storage box, thereby enabling the pair of parallel edges to support the hanging file folder.

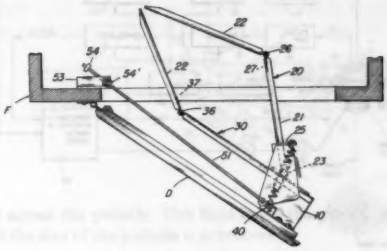
3,724,921

DOOR MOUNTED, DOOR OPERATED HOLDER FOR COLLAPSIBLE LIMP BAGS

Connie Lake, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,475
Int. Cl. A47b *83/00, 81/00;* B65b *67/04*
U.S. Cl. 312—237 **8 Claims**

A support bracket holds one end, each, of a pair of arms which are arranged to have a refuse bag threaded over the open ends. The bracket is adapted to be mounted on a kitchen cabinet door, for example on an under-sink cabinet door. The movable arm is pivoted, and the arms are held either together, or spread apart, by a spring travelling over the pivot point. The arms are spread apart by an operating member, such as a rod having an end secured to the kitchen sink frame so that, upon opening the door, the mouth of the bag will be spread apart by the arms, for placing of refuse therein, and, upon closing of



the door, the spring will snap the arms together to hold the bag within the cabinet with its mouth resiliently closed.

3,724,922

SCOPE FOR VIEWING THE INTERNAL SURFACE OF A BORE OF SIMILAR CAVITY

Ira David Jones, 1023 S. Main Street, South Bend, Ind.

Filed Dec. 17, 1970, Ser. No. 99,153
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 R **8 Claims**

A scope for viewing the internal surfaces of bores or similar cavities which includes a rod of optically clear material having a viewing end and an image transmitting end. The transmitting end of the rod includes two optical surfaces which have an included angle of 45° therebetween and which serve to direct image producing light transmitted internally through the rod onto the internal surface to be viewed and to thereafter transmit the image of the internal surface to the viewing end of the rod. The rod includes an annular light gathering surface which is positioned between the viewing and transmitting ends of the rod and which serves to transmit light from an external source internally through the rod to the transmitting end thereof for the purpose of illuminating the internal surface.

3,724,923

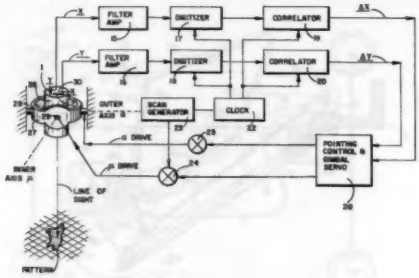
DIGITAL CORRELATION PATTERN TRACKER

John J. Fischer, Fullerton, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed April 4, 1968, Ser. No. 720,435
Int. Cl. G05b *1/00*
U.S. Cl. 356—158 **15 Claims**

A pattern tracker which utilizes orthogonal photosensor strips fixed in the image plane of a tracking telescope. The telescope is alternately dithered to cause first the one and then the other photosensor strip to scan the pattern producing a line scan in one coordinate alternated with a line scanned in a perpendicular coordinate. Each photosensor's output is divided into time increments and each such increment is digitized by comparison to some threshold value thus producing a digital word describing the light intensity silhouette of

the pattern scanned in each of two orthogonal coordinates. The above process is repeated at a later time, the digital words



produced from the latter scan are correlated with those from the prior scan to determine pattern movement between scans.

3,724,924

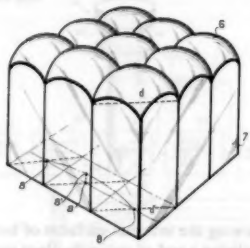
MULTIPLE FOCUSING DEVICE

Rene Lenfant, 91-Paray-Vieille-Poste, and Guy Petitjean, 92-Clamart, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Continuation-in-part of Ser. No. 886,898, Dec. 22, 1969, abandoned. This application Dec. 23, 1970, Ser. No. 101,080

Int. Cl. G02b *27/00*

U.S. Cl. 350—167 **8 Claims**



A multiple focusing device for radiation made up of a plurality of right prisms each having a corresponding end or base cut and polished to form a spherical cap producing a focal point for the incident radiation, the plurality of prisms being grouped so that the focal points produced thereby fall within a plane transverse to the incident radiation.

3,724,925

Patent Not Issued For This Number

3,724,926

OPTICAL PULSE MODULATOR

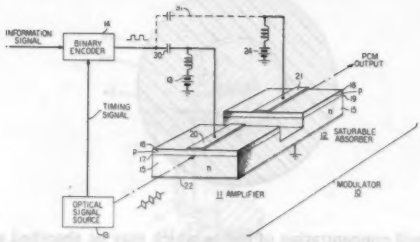
Tien Pei Lee, Middletown, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Aug. 9, 1971, Ser. No. 140,127

Int. Cl. G02f *1/36*

U.S. Cl. 350—160 R **7 Claims**

A high speed optical modulator, in accordance with the present disclosure, comprises a pair of p-n junction diodes, one of which is an amplifier, and the other of which is a saturable absorber. A constant current initially forward-biases the amplifier to approximately unity gain. A pulse-encoded information signal is superimpressed upon this constant bias such that incident optical pulses are transmitted at unity gain for one binary state of the information signal and at a greater gain for the other binary state. The power ratio of the optical pulses for the two binary states is then increased by the saturable absorber which attenuates the smaller optical signal to a much greater extent than it attenuates the larger signal.



3,724,927

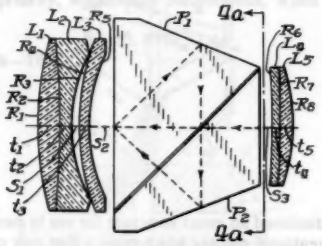
OPTICAL ZOOM AND IMAGE-ROTATING SYSTEM

Arthur Cox, Park Ridge, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 750,612, Aug. 6, 1968. Pat. No. 3,582,203. This application March 30, 1971, Ser. No. 129,618

Int. Cl. G02b *17/08*

U.S. Cl. 350—203 **2 Claims**



Optical systems for microfilm readers or the like having image rotation capabilities and zoom lens means for selectively varying the image magnification. The optical systems include an aperture stop positioned remote from the microfilm and substantially adjacent the projection screen for maintaining constant screen brightness through a broad range of magnification.

3,724,928

MANUALLY OPERATED REMOTE CONTROL TRUCK MIRROR

Harry C. Olsen, Farmington; Ludwig J. Tischler, Huntington Woods; Heinz C. Wernecke, Southfield, all of Mich., assignors to F. L. Jacobs Co., Southfield, Mich.

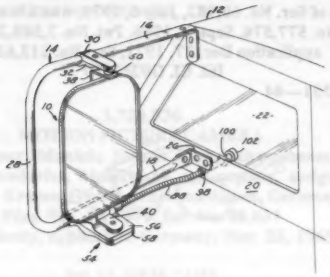
Filed Nov. 30, 1971, Ser. No. 203,128

Int. Cl. G02b *5/08*

U.S. Cl. 350—289 **1 Claim**

A rear view mirror assembly for mounting on the side of a vehicle is provided. The assembly includes upper and lower support arms secured to the vehicle. A mirror is attached to the support arms by means of upper and lower support structures. The support structures each include pivotal means for pivotal mounting of the mirror. One of the support structures serves the dual purpose of securing the mirror to a support

arm and housing an actuating mechanism for powered mirror adjustment from a remote location. A flexible shaft extends



from the actuating mechanism to the interior of a vehicle cab for manual rotation of the mirror at a remote location.

3,724,929

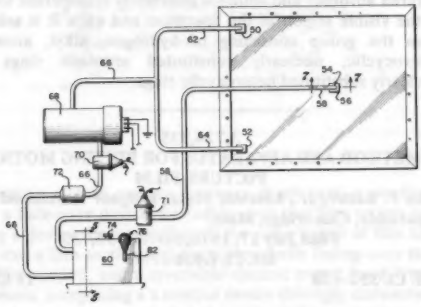
AIR-FREE LIQUID VARIABLE LIGHT FILTER SYSTEM

Mount L. Lacy, Jacksonville, Fla., assignor to Mount Lacey Enterprises, Inc., Salt Lake City, Utah

Continuation of Ser. No. 628,984, April 6, 1967, abandoned. This application Jan. 12, 1971, Ser. No. 105,985

Int. Cl. G02b *5/24*

U.S. Cl. 350—312 **23 Claims**



A hermetically sealed, air-free system for screening and filtering electromagnetic ray energy from the sun, having a means within the system for changing from one degree of screening and filtering to another by the use of two or more immiscible liquids in a light transmission cavity, said liquids having different specific gravities so as to maintain separate liquid bodies while stationary within the system and while being changed.

3,724,930

METHOD OF FORMING AND COOLING PINHOLE SPATIAL FILTER FOR HIGH POWER LASER

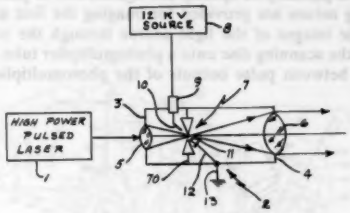
William M. Farmer, Tullahoma, Tenn., assignor to The United States of America as represented by the Secretary of the Air Force

Division of Ser. No. 96,819, Dec. 10, 1970. This application July 21, 1972, Ser. No. 274,031

Int. Cl. G02b *27/30*

U.S. Cl. 350—320 **1 Claim**

An electrostatically cooled spatial filter for high powered pulsed lasers wherein the filter comprises a first lens which focuses a laser beam on a pinhole, and a second lens positioned behind the pinhole to receive the beam. To prevent the laser beam from destroying the pinhole an electric field is ap-



plied across the pinhole. This field cools the pinhole and as a result the size of the pinhole is preserved.

3,724,931

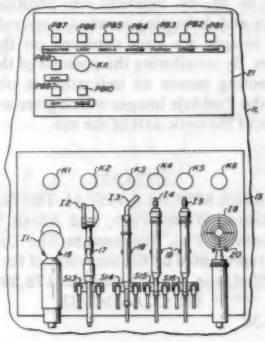
LIGHTING SYSTEM CONTROL FOR OPHTHALMIC EXAMINATIONS

Herbert J. Nevyas, 2101 Walnut Street, Apt. 1301, Philadelphia, Pa., and Wilfred Klein, 511 Rock Glen Drive, Wynnewood, Pa.

Filed April 28, 1971, Ser. No. 138,225

Int. Cl. A61b *3/00*; **H05b** *37/02*; **F21v** *33/00*

U.S. Cl. 351—1 **10 Claims**



A control system coordinates fixture lighting in an ophthalmic examination room with the selection by a physician of a particular ophthalmic instrument with which a patient is to be examined. Selection of a portable instrument operates the necessary switches to automatically power the instrument and establish the optimum ambient conditions of room light for conducting the examination with the instrument selected.

3,724,932

EYE TRACKER AND METHOD

Tom N. Cornsweet, Atherton, and Hewitt D. Crane, Portola Valley, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

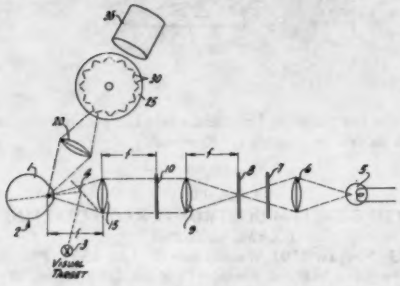
Filed April 9, 1971, Ser. No. 132,747

Int. Cl. A61b *3/10*

U.S. Cl. 351—7 **16 Claims**

A technique and apparatus for two dimensional tracking of eye position. An infrared pattern is projected into the eye and measurements taken of the spatial separation of the first and fourth Purkinje reflections, the reflections from the cornea and the back of the eye lens, respectively. Because the centers of curvature of the surfaces of the cornea and lens lie at different distances from the center of rotation of the eye, these reflections move in opposite directions under eye rotation, in either the vertical or the horizontal direction. During transla-

tion of the eye in either the vertical or the horizontal direction the spacing or separation between the two Purkinje images does not change. In one embodiment, a rotating scanning disc having a plurality of spaced orthogonal slits is provided and imaging means are provided for imaging the first and fourth Purkinje images of the light source through the orthogonal slits of the scanning disc onto a photomultiplier tube. The time period between pulse outputs of the photomultiplier tube is



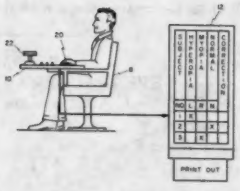
proportional to the separation of the first and fourth Purkinje images. In another embodiment the two Purkinje images are deflected so as to be incident on photodetectors. The photodetectors and deflecting means are movable so that the two Purkinje images are kept centered on their respective photodetectors. By monitoring the position of the photodetectors and deflecting means an indication is obtained of the separation of the Purkinje images which gives an indication of the orientation of the optic axis of the eye.

3,724,933

LASER SPECKLE VISUAL TESTER

Windell N. Mohon, Winter Park, and Alfred N. Rodemann, Maitland, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 8, 1971, Ser. No. 178,584
Int. Cl. A61b *3/02*
U.S. Cl. 351—36 **1 Claim**



Large groups of persons may be simultaneously tested for nearsightedness and farsightedness by use of a laser speckle pattern formed by projecting a laser beam onto a surface. A speckle pattern is projected on a surface and either the surface or the beam is moved with respect to the other. The direction of apparent motion of the pattern observed by a subject indicates the presence of myopia or hyperopia.

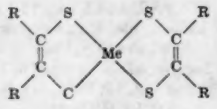
3,724,934

SUNGLASSES HAVING NOVEL PLASTIC OPTICAL ELEMENT FOR LENSES

Stanley M. Bloom, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 60,982, July 6, 1970, which is a division of Ser. No. 577,576, Sept. 2, 1966, Pat. No. 3,588,216. This application Dec. 27, 1971, Ser. No. 212,650
Int. Cl. G02c *7/10*
U.S. Cl. 351—44 **10 Claims**

An element for filtering infrared light useful for example, as an optical lens. A metal complex is advantageously employed as an infrared absorber in elements of the type described. The infrared absorbers can be represented by the following formula:



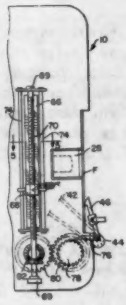
where Me is a metal of the first, second or third transition metal series which will provide a complex that is an effective infrared absorber and which is effectively transparent to light in the visible region of the spectrum and each R is selected from the group consisting of hydrogen, alkyl, aromatic, heterocyclic, nuclearly substituted aromatic rings and nuclearly substituted heterocyclic rings.

3,724,935

METHOD AND APPARATUS FOR EDITING MOTION PICTURE FILM

John F. Batter, Jr., Lincoln, Mass., assignor to Polaroid Corporatioa, Cambridge, Mass.

Filed July 17, 1970, Ser. No. 55,735
Int. Cl. G03b *21/48*
U.S. Cl. 352—38 **11 Claims**



A motion picture film editing method and apparatus by which film portions to be deleted during projection are indicated by signals recorded on a fixed record track attached to a cassette housing the film. A scanning transducing head is provided in the projector and advanced in synchronism with the film advance mechanism to sense the recorded signals and control film advance speed in a manner such that the portions

of the film to be deleted are fed at high speeds past the projector light path whereas those to be viewed are fed at normal speeds. Also, the light path is blocked during passage of the deleted film portions therethrough.

3,724,936

MOTION PICTURE CAMERA

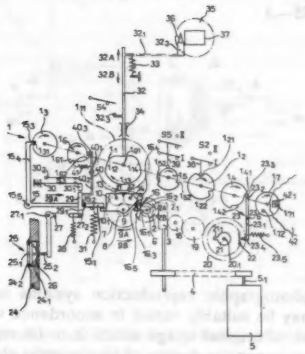
Rudolf Leistner, Munich; Johann Roth, Schwabhausen, and Alfred Renndorfer, Munich, all of Germany, assignors to Niezoldi & Kramer GmbH, Munchen-Allach, Germany

Filed Nov. 12, 1970, Ser. No. 88,631

Claims priority, application Germany, Nov. 22, 1969, P 19 58 682.4

Int. Cl. G03b *21/36*

U.S. Cl. 352—91 **19 Claims**



A motion picture camera having a diaphragm, a winding spool, a fade-over device for fading-over two film scenes including a device for measuring off the same length of film for fading-out a film section and for subsequently fading-over the same film section, and a reversible electric motor for driving the camera, comprising a a control device drivingly connected to the electric motor such that the control device rotates always in the same direction and that it carries out during one single complete revolution the following fade-over phases necessary for a complete fade-over of the film scene: a first phase coupling exposing first the film section with the diaphragm closing in a continuous manner, a second phase coupling rewinding the film section with the diaphragm closed, and stopping the electric motor, and a third phase coupling re-exposing the film section with the diaphragm opening in a continuous manner.

3,724,937

MOTION PICTURE CAMERA DRIVE MECHANISM

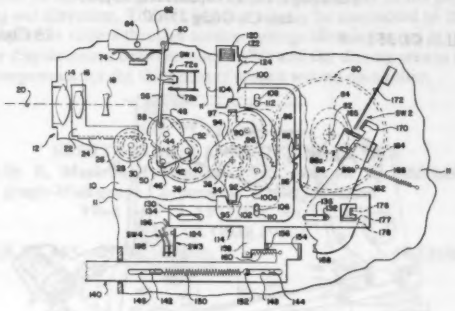
Gerald L. Jenkins; Vernon H. Jungjohann; Edgar S. Marvin, all of Rochester, and Neil G. Seely, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,221

Int. Cl. G03b *3/10*

U.S. Cl. 352—140 **7 Claims**

A motion picture camera drive mechanism includes a single motor which is used for driving (separately or simultaneously) a film pull down mechanism which advances film past an exposure aperture and a mechanism for adjusting at least one lens element in a zoom lens system. When the camera drive mechanism is to be energized, provision is made for first energizing a circuit to an automatic exposure control system and



then operating the film pull down mechanism, thereby effecting correct exposure of the first frame of film.

3,724,938

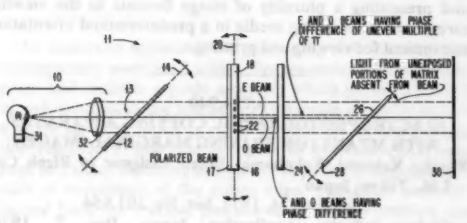
VARIABLE CONTRAST IMAGE PROJECTION

Daniel A. Nepela, 18960 Fernbrook Court, Saratoga, Calif.

Filed Nov. 28, 1969, Ser. No. 880,774

Int. Cl. G03b *21/14*; G02b *21/14, 1/24*

U.S. Cl. 353—20 **27 Claims**

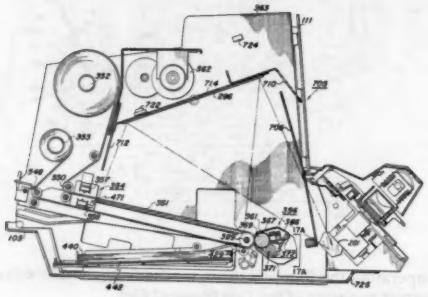

E AND O BEAMS HAVING PHASE DIFFERENCE OF UNEVEN MULTIPLE OF π
LIGHT FROM UNEXPOSED PORTIONS OF MATRIX ABSENT FROM BEAM
E BEAM
O BEAM
POLARIZED BEAM
E AND O BEAMS HAVING PHASE DIFFERENCE

A system for controlling the contrast of projected images includes a polarizer, phase plate, analyzer, and image matrix comprising an exposed and developed photographic film defining an original image having light and dark portions. A beam of polarized light of a selected frequency is directed through the system and onto a screen. The polarizer, phase plate, and analyzer are adjustable to vary the contrast of the projected image through partial or complete extinction, by destructive interference, only of light passing to the projected image from the unexposed portions of the film. For light of a given intensity incident upon the film, the contrast, i.e., the pattern of light intensities, in the projected image, is different from that of the original image. This occurs because the intensity of light in the projected image passing thereto from the unexposed film portions is diminished through at least partial extinction. The background dark level, however, of the original image defined by the intensity of light passing from the exposed matrix portions is substantially unchanged in the projected image, relatively little extinction of such light occurring. Contrast in the projected image may be converted from intensity to color by using a projected beam of light with a mixture of different frequencies and adjusting the polarizing and phase plate elements to extinguish partially or completely light of a particular frequency. The image matrix comprises an exposed and developed film having a non-birefringent substrate and a superposed partially birefringent composition containing metallic silver and oriented fatty acid silver salt crystals.

3,724,939
PHOTORECEPTOR LOADING SYSTEM

James R. Cassano, and Frank J. Sanza, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 18, 1970, Ser. No. 73,565
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 15 Claims

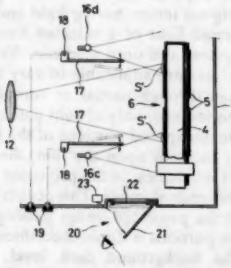


Combination viewing and printing apparatus characterized by the capability of: producing a positive print from either a negative or a positive input film; printing on plain sheet paper which is fed from the apparatus at an optimum location; selecting the information to be printed from a microfilm transported by means of a differential drive arrangement which optimizes the film movement; accommodating various types of recording media, for example roll microfilm and microfiche; and presenting a plurality of image formats to the viewing screen and a recording media in a predetermined orientation convenient for viewing and printing.

3,724,940
ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH MEANS FOR ERASING MARGINAL IMAGES

Yutaka Koizumi, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1971, Ser. No. 201,654
Claims priority, application Japan, Dec. 7, 1970, 45/107647; Dec. 15, 1970, 45/111172
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 R 5 Claims

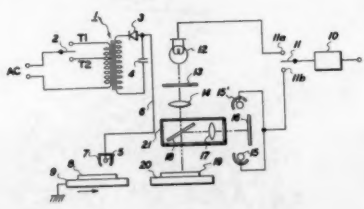


Electrophotographic copying apparatus, such as electrophotographic duplicators, electrophotographic plate making machines and the like, in which an image of an original is formed on a photosensitive sheet, said apparatus provided with means for erasing undesirable images formed on selected marginal areas of the photosensitive sheet. Eraser light sources are provided for illuminating the marginal areas of a photosensitive sheet for the purpose of preventing the formation of undesirable images on said marginal areas. Manually adjustable intercepting plates are interposed between the eraser light sources and the photosensitive sheet for the purpose of selecting the particular marginal portions of the photosensitive sheet which are to be illuminated by the eraser light sources. The photosensitive sheet is transported to an exposing position by means of conveyer belts and is held against said conveyer belts by means of a suction box. A plurality of concentric frames may be drawn on the suction box, and the conveyer belts may be made of transparent material, such that an operator looking through a viewing window before a photosensitive sheet is transported to the exposing position may adjust the intercepting plates to allow illumination of the marginal area outside a selected frame by said eraser light sources, and may adjust the position of the original to make sure its image falls within a selected frame on the suction box.

3,724,941
ELECTROPHOTOGRAPHIC APPARATUS

Satoru Honjo; Seiji Matsumoto, and Masaaki Takimoto, all of Asaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 16, 1971, Ser. No. 181,022
Claims priority, application Japan, July 22, 1970, 45/63531
Int. Cl. G03g *15/02*
U.S. Cl. 355—3 4 Claims

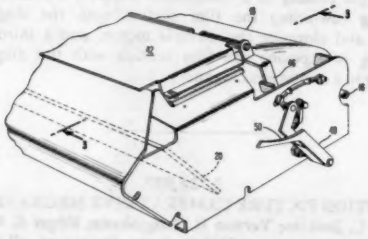


Electrophotographic reproduction systems in which the contrast may be suitably varied in accordance with the particular type of original image which is to be reproduced by varying the amount or degree of electrostatic charge applied to a photoreceptive surface during uniform charging thereof.

3,724,942
PHOTOCONDUCTOR DISCHARGE SHUTTER ASSEMBLY

David K. Gibson, and Frederick W. Johnson, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed April 12, 1972, Ser. No. 243,137
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 7 Claims



A shutter arrangement is disclosed which at pre-selected intervals opens and closes to either permit light to illuminate a document plane or reflect light to the photoconductor of an electrostatic copying machine having the capability of half tone development, thus preventing the toning of unexposed areas of the photoconductor which bear no relation to the document being copied. The control arrangement opens the shutter during the normal scanning portion when a document

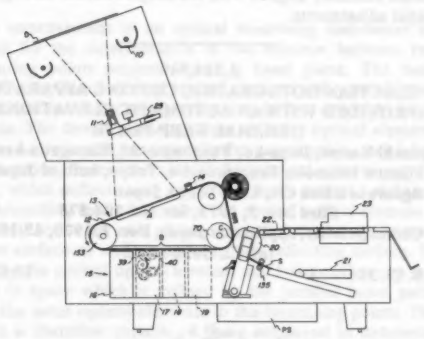
is exposed to the illumination light and closes the shutter at a point corresponding approximately to the end of the document scan thus reflecting light to the photoconductor as if the photoconductor was receiving light from a white document, to discharge the unused portion of the photoconductor. This prevents excessive toning and the associated cleaning problems since this portion of the photoconductor will not have the toner transferred from it to a copy sheet.

3,724,943

COLOR REPRODUCTION APPARATUS

Vaidevutis C. Draugelis; William R. Hartman, Jr., both of Rochester; Michael J. Langdon, Webster, and Alan F. McCarroll, Rochester, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 4, 1969, Ser. No. 830,280
Int. Cl. G03g *15/00*
U.S. Cl. 355—4 **5 Claims**



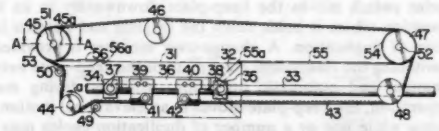
A multi-color electrostatic printing machine having processing components adapted to produce an image for each color of an original being copied, individual color developing units for effecting developed of the corresponding images and a program arrangement for coordinating in timed sequence the operation of the processing components and the transfer of each developed image in superimposed relationship upon sheets of paper.

3,724,944

LIGHT INTERCEPTING SCREEN WINDING AND PAYING-OUT DEVICE FOR COPYING MACHINES

Keiji Sugita; Hideaki Mochimaru, and Toshio Watanabe, all of Ohta-ku, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Oct. 1, 1971, Ser. No. 185,589
Int. Cl. G03b *27/72*
U.S. Cl. 355—18 **6 Claims**



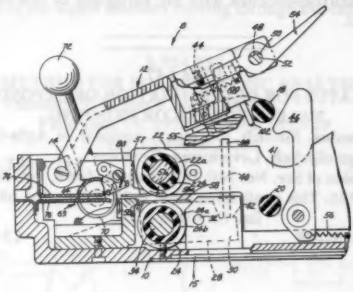
The device includes a movable optical system mounted for reciprocation between, and along a travel path parallel to, an original, to be duplicated, and a photosensitive sheet arranged in spaced parallel relation to each other to expose the sheet progressively to an optical image of the original. A pair of screen winding rollers are rotatably mounted in parallel relation to each other at respective ends of the travel path and extend transversely of the travel path, and a pair of light intercepting screens have first ends connected to respective ends of the optical system and second ends connected to respective rollers. An endless belt type of driving means is operatively connected to the optical system and to both rollers, and is operable to reciprocate the optical system while rotating one roller in the winding direction and the other roller in the paying-out direction. The driving means may be connected to the respective rollers through torsion springs allowing some angular displacement between each roller and the driving means to compensate for the thickness of screen wound on a roller.

3,724,945

SHEET FEEDING AND CUTTING DEVICE

Felix R. Masiello, Parsippany, N.J., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed June 14, 1971, Ser. No. 152,835
Int. Cl. G03b *29/00*
U.S. Cl. 355—29 **18 Claims**



An improved apparatus for processing web material is advantageously associated with a film magazine of a photocomposer and includes a guide assembly which prevents jamming of web material in the magazine. This guide assembly includes a guide element which is movable between an inactive position disposed to one side of a path of movement of a cutter edge in a shear assembly and an active position disposed in the path of movement of the cutter edge. The guide element is moved from the inactive position to the active position upon movement of the cutter edge through the path of movement of the sheet material. The web material is moved in a step-by-step manner past an exposure window by a pair of feed rollers to expose incremental portions of the web material to an original at the exposure window. To enable the extent of movement of the sheet material to be adjusted, at least one of the feed rollers is made of a resiliently yieldable elastomeric material so that the surface of the feed roller is deformable to greater and lesser extents. To facilitate loading of the web material in the magazine, a loading gate is movable from a closed position blocking access to the feed rollers to an open position.

3,724,946

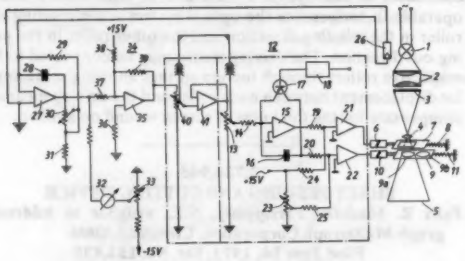
PHOTOGRAPHIC PRINTING ARRANGEMENT

Walter Knapp, and Othmar Schneider, both of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 20, 1971, Ser. No. 181,885
Claims priority, application Germany, Sept. 23, 1970, P 20 46 887.5
Int. Cl. G03b *27/78*
U.S. Cl. 355—36 **7 Claims**

Photographic arrangement for copying an original which includes illuminating means for illuminating the original and timing means for terminating the illumination after a preadjustable time interval corresponding to the density of the original. This photographic arrangement also includes photoelectric transducing means furnishing an illumination signal corresponding to the lighting impinging thereon.

Finally, the photographic arrangement also includes energizing means interconnecting the photoelectric transducing



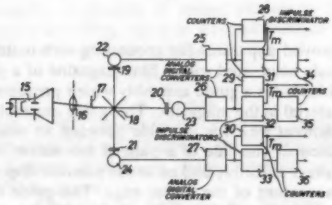
means with the timing means so as to vary the energization signal in correspondence with the variations of the illumination signal.

3,724,947

APPRATUS FOR DETERMINATION OF EXPOSURE VALUES FOR COLOR PRINTING

Rudolf Paulus, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 740,262, June 26, 1968, Pat. No. 3,582,325. This application Sept. 2, 1970, Ser. No. 68,854
Int. Cl. G03b 27/78
U.S. Cl. 355—38 **13 Claims**



Prints of color photographic negatives are obtained by scanning a finite number of unit areas on a negative to determine certain of its criteria for blue, green and red colors. Such criteria are compared with sets of reference criteria which are stored in a memory unit together with empirically determined optimum correction factors for each set of reference criteria. The comparison is made for the purpose of locating or selecting those correction factors which are best suited for adjustment of the exposure control in an automatic printer. The thus obtained information is fed to the exposure control not later than when the freshly scanned negative enters the printing station.

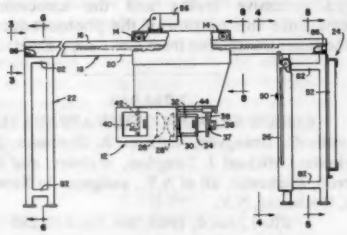
3,724,948

OVERHEAD RAIL SUPPORTING STRUCTURE FOR PHOTOGRAPHIC APPARATUS

Joseph H. Wally, Jr., and Samuel E. Wilson, both of Shawnee, Mission, Kans., assignors to Western Blue Print Co., Kansas City, Mo.

Filed May 28, 1971, Ser. No. 147,762
Int. Cl. G03b 27/52
U.S. Cl. 355—55 **18 Claims**

In photographic apparatus, spatial adjustments of its optical head to a subject holder obtain along overhead rails which are supported on a long spanning member embodying interfitted channel members of folded heavy gauge sheet metal. Said spanning member rests at its opposed ends on two piers each comprising four spaced posts joined by cross beams adjacent their top and base. The composite structure affords a rigid and stable support for the head such that its film platen and lenses



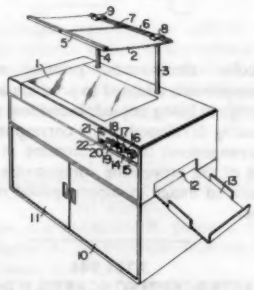
remain coaxially aligned with the subject holder through said spatial adjustments.

3,724,949

ELECTROPHOTOGRAPHIC COPYING APPARATUS PROVIDED WITH AN AUTOMATIC ELEVATIONAL ORIGINAL KEEP-PLATE

Tadaaki Kanno, Isoga-ku, Yokohama-shi, Kanagawa-ken, and Minoru Iwamoto, Shinagawa-ku, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1971, Ser. No. 204,575
Claims priority, application Japan, Dec. 7, 1970, 45/108252
Int. Cl. G03b 27/62
U.S. Cl. 355—75 **10 Claims**

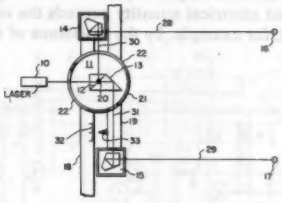


A copying apparatus having an automatically elevatable original keep-plate which is normally maintained in contact with the original-receiving exposure surface when the apparatus is inoperative but which is moved upwardly to an upper position when the power switch is actuated to permit an original to be placed on the exposure surface. Actuation of the print switch moves the keep-plate downwardly to its lower position where it holds down the original and permits initiation of duplication. A change-over member is provided for switching the elevational movement of the keep-plate between manual and automatic operation, whereby during manual operation, the keep-plate moves in an elevational motion only once while one or a number of duplication cycles may take place with a single original; and during automatic operation, the keep-plate moves in elevational motion and dwells for a predetermined time interval in its upper position each times a series of duplication cycles is performed to permit the old original on the exposure surface to be replaced by a new original prior to beginning the next series of duplication cycles thus producing a predetermined number of duplicates of a plurality of originals. Suitable mechanism and circuitry are disclosed for achieving the desired operations.

3,724,950
OPTICAL INSTRUMENT FOR DETERMINING THE DISTANCE BETWEEN TWO MEASURING POINTS

Erik Niss, Lidingo, Sweden, assignor to Aga Aktiebolag, Lidingo, Sweden

Filed May 21, 1971, Ser. No. 145,799
Int. Cl. G01c 3/00
U.S. Cl. 356—3 3 Claims

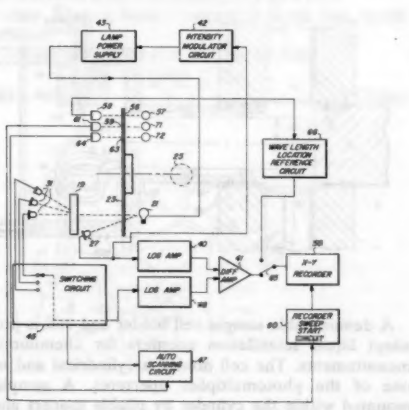


An improvement in an optical measuring instrument intended for the determination of the distance between two measuring points projected onto a basel plane. The basic device comprises a central optical element with a semi-transparent surface and a totally reflecting surface at a right angle thereto. The device also comprises an outer optical element, such as a mirror or a pentagonal prism, arranged in each beam path between the central optical element and each measuring point, which deflects each respective beam path at a right angle. According to the invention, the central optical element is rotatable about an axis which is parallel to the semi-transparent surface as well as to the totally reflecting surface. By rotating the central optical element one beam will sweep in a plane in space which is defined by the parallel beam paths from the outer optical elements to the measuring points. The device is therefore capable of being employed to determine the location of a random point relative to that plane.

3,724,951
METHOD AND APPARATUS FOR DETERMINING RADIATION TRANSMISSION CHARACTERISTICS OF A GENERALLY TRANSPARENT MEDIUM

David C. Seelbinder, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1971, Ser. No. 176,492
Int. Cl. G01n 15/02, 21/00, 21/26
U.S. Cl. 356—102 15 Claims

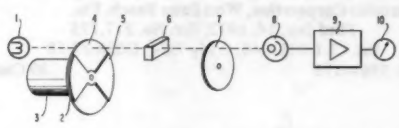


A device for determining the spectral radiation transmission characteristics and size-frequency distribution of very small particles dispersed in a generally transparent liquid medium comprises a transparent sampling cell through which the liquid medium is moved at a desired rate and subjected to a beam of radiation by a suitable optical system. The optical system, which includes a rotatable, spectrally variable filter and a suitable mask limits the beam of radiation incident on one side of the cell to a narrow band, the peak wavelength of which is a function of angular displacement. On the opposite side of the sampling cell, a plurality of photosensitive detectors are arranged for generating an electrical signal from the radiation incident thereon that is in accordance with the amount of radiation emitted from the cell at various angles relative to the axis of the beam of radiation. A photosensitive detector is also arranged relative to the one side of the cell and the transmittance side of the filter to detect the radiation incident on the one side of the cell so as to provide a reference signal for relative measurement of the radiation emitted by the cell on the other side thereof. The signals derived from the plurality of detectors and from the reference detector are amplified and by suitable circuitry generate an analog output signal that corresponds to the spectral transmission characteristics of the liquid medium moving through the cell.

3,724,952
METHOD FOR POLARIMETRIC ANALYSIS

Carl A. Vossberg, P.O. Box 6, Umatilla, Fla.

Filed June 14, 1971, Ser. No. 152,729
Int. Cl. G01n 21/40
U.S. Cl. 356—114 13 Claims

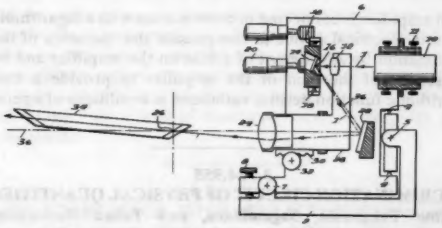


An apparatus and method for determining physical properties and/or composition of a test specimen by passing a beam of polarized radiation therethrough and measuring the effects of the specimen on the beam. The effects measured are rotation of the polarization of the beam, absorption of the beam, and depolarization of the beam, all of which can be measured separately or simultaneously.

3,724,953
OPTICAL ALIGNMENT DEVICE PROVIDING A VIRTUAL PIVOTING LASER BEAM

Thomas F. Johnston, Jr., Ithaca, N.Y., assignor to Lansing Research Corporation, Ithaca, N.Y.

Filed Feb. 7, 1972, Ser. No. 224,036
Int. Cl. G01b 11/26
U.S. Cl. 356—153 16 Claims



A device, which incorporates a laser producing a beam useful in orienting optical elements, includes a pivoting mirror mounted for rotational adjustment at the point of intersection (the real pivot point) of two intersecting, orthogonal, rotational axes. The beam from the laser passes through a first lens (used for control of the spreading of the beam) and impinges on the mirror at the real pivot point. The reflected beam

emerges from this stationary pivot point at a variable angle as rotational adjustments to the mirror are made. The reflected beam passes through a second (output) lens, which forms an image, the virtual pivot point, of the real pivot point at a distance in front of the output lens given by the lens maker's formula. The stationariness of the beam at the real pivot point is transferred to its image, the virtual pivot point, where the input aperture of the optical system to be aligned is located. This makes it possible to vary the angle of the beam as desired in putting the beam along the optical axis of the system being aligned, while the beam always passes through the virtual pivot point. Adjustments are also provided in the device for positioning the virtual pivot point on the system input aperture, by focussing the output lens (for bringing the virtual pivot into the plane of the input aperture, along the beam direction) and by adjustments in height and lateral position, for centering the virtual pivot transversely, in the plane of the input aperture.

ERRATUM

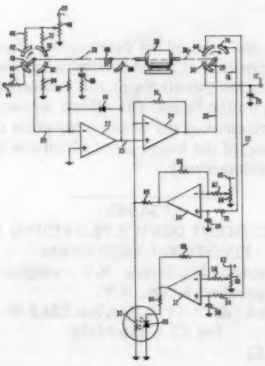
For Class 356—158 see:
Patent No. 3,724,923

3,724,954

LOGARITHMIC CIRCUIT WITH AUTOMATIC COMPENSATION FOR VARIATIONS IN CONDITIONS OF OPERATIONS

Alex W. Dreyfoos, Jr., Palm Beach, Fla., assignor to Photo Electronics Corporation, West Palm Beach, Fla.

Filed Jan. 14, 1972, Ser. No. 217,775
Int. Cl. G01j *3/46*; G06g *7/24*; G03b *27/78*
U.S. Cl. 356—175 **39 Claims**



An amplifier is connected in combination with a logarithmic function electrical device to compensate the operation of the combination by adjustment of a bias on the amplifier and by adjustment of the gain of the amplifier to provide a true logarithmic function despite variations in conditions of operation.

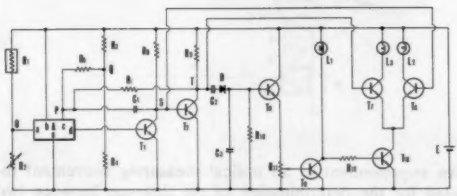
3,724,955

DISCRIMINATION CIRCUIT OF PHYSICAL QUANTITIES

Makoto Takahashi, Sagamihara, and Takao Hashimoto, Kawasaki, both of Japan, assignors to Yashica Company, Ltd., Japan

Filed July 6, 1971, Ser. No. 159,682
Claims priority, application Japan, July 7, 1970, 45/58956; July 7, 1970, 45/58957
Int. Cl. G01j *1/42, 1/44*
U.S. Cl. 356—227 **10 Claims**

A discrimination circuit of physical quantities comprises a converter element for converting a physical quantity to an electrical quantity which is compared with a reference potential in a differential amplifier. The output terminal of the differential amplifier is connected to the input terminal of a first switching device and the output terminal thereof is connected to the input terminal of a second switching device. A feedback circuit including a capacitor and a resistor is provided between each output terminal of the first and second switching devices and one input terminal of the differential amplifier. The differential amplifier produces an output only when the converted electrical quantity exceeds the reference potential (defined, for example, by the resistance of a potentiometer), and the first and second switching devices are brought into three discriminative states in accordance with the value of the first input signal of the differential amplifier which is a function of the converted electrical quantity. That is, the discriminative stages correspond to when the physical quantity is in the allowable region and over and under the allowable region. The first and second switching devices oscillate while the physical quantity is in the allowable region, the region being determined by a variable resistor and the oscillation frequency being determined by a capacitor in a feedback circuit. One or the other of the switching devices are ON when either of the two states discriminative states exist.

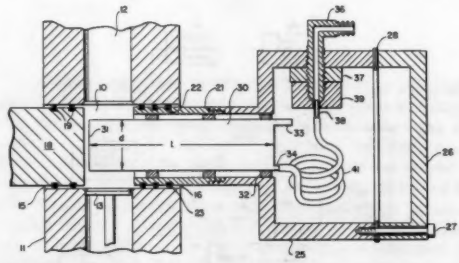


3,724,956

DEMOUNTABLE SAMPLE CELL HOLDER AND CELL FOR LIQUID SCINTILLATION COUNTERS

Michael P. Neary, Newport Beach, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 27, 1970, Ser. No. 93,253
Int. Cl. G01n *1/10*
U.S. Cl. 356—246 **9 Claims**



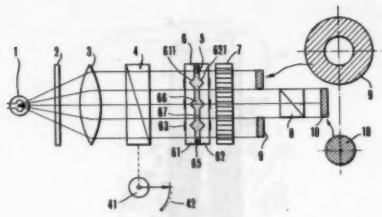
A demountable sample cell holder and cell is provided to adapt liquid scintillation counters for chemiluminescence measurements. The cell holder is cylindrical and mounts in one of the photomultiplier apertures. A sample cell is mounted within the cylinder by pliable spacers and is connected to inlet and outlet fillings on the cell holder by coiled black tubing. The cell is aluminized to enhance photon transfer efficiency and painted black. The holder is formed into two sections which may be unscrewed so that differing size cells may be utilized.

3,724,957

CONCENTRATION MEASURING APPARATUS

Tokutaro Tamate; Hirokazu Habuchi, and Tsutomu Hirayama, all of Tokyo, Japan, assignors to Yokogawa Electric Works Limited, Tokyo, Japan

Filed March 4, 1971, Ser. No. 121,071
Int. Cl. G01n *21/40*
U.S. Cl. 356—116 7 Claims



There are provided a sample cell containing a solution containing an optically active substance between a polarizer and an analyzer of a Nicol system, a first photoelectric detector disposed to receive the light activated in accordance with the concentration of the optically active substance, a second photoelectric detector disposed to receive the light transmitted through the solution independently of the optical activity, and means for determining the ratio of the outputs of the first and second photoelectric detectors.

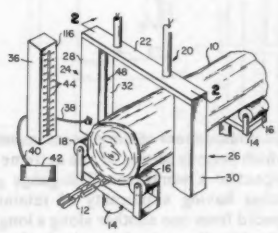
Where the concentration measuring apparatus is used to independently measure the concentrations of pulp and clay in a solution used in a paper making process, said means for determining the ratio of the outputs of the first and second photoelectric detectors determines the concentration of the pulp. In this case, there is further provided a transmission and scattering type concentration meter including a third photoelectric detector for receiving the light transmitted by the pulp and clay, a fourth photoelectric detector for receiving the light scattered by the pulp and clay, second means responsive to the outputs of the third and fourth photoelectric detectors to provide an output corresponding to the concentrations of the pulp and clay and means responsive to the outputs of the first and second means for determining the concentration of the clay.

3,724,958

SCANNING AND CONTROL APPARATUS

John G. Callan, Sharon, Mass., assignor to Knox, Inc., South Walpole, Mass.

Filed March 9, 1970, Ser. No. 17,735
Int. Cl. G01b *11/10*
U.S. Cl. 356—160 5 Claims



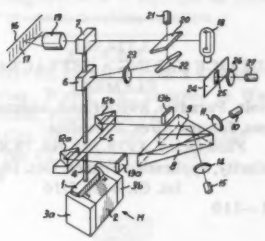
Apparatus for measuring differences in a dimension of objects and actuating equipment responsive to a plurality of magnitudes of the dimension employs a plurality of first electrical circuits, each having first and second states of energization and corresponding to a particular magnitude of the dimension, and a plurality of second electrical circuits, respectively corresponding to one of the first circuits and arranged when energized to actuate the equipment in accordance with one of the plurality of magnitudes of the dimension. The second circuit corresponding to a particular magnitude is energized when the corresponding first circuit has its first state of energization and the first circuit corresponding to the next magnitude greater than the particular magnitude has its second state of energization.

3,724,959

HIGH PRECISION PHOTOELECTRIC MICROSCOPE FOR READING THE MARK OF A PRECISION RULER

Maurice Koulicovitch, Geneva, Switzerland, assignor to Societe Genevoise D'Instruments De Physique, Geneva, Switzerland

Filed June 7, 1971, Ser. No. 150,641
Claims priority, application Switzerland, June 29, 1970, 9765/70
Int. Cl. G01b *11/04*
U.S. Cl. 356—170 9 Claims



This invention concerns a high precision photoelectric microscope for reading the stroke of a precision ruler, comprising an optical sighting device, a deflector causing a pencil of luminous rays to oscillate periodically from one side to the other of a median position, and a photoelectric cell capturing the luminous pencil reflected by the surface of the precision ruler and controlling an electronic device for indicating the eccentricity of the mark aimed at. This apparatus is characterized in that it comprises a deflection member, attached to the oscillating deflector, which receives a portion of the incident rays and returns them through a fixed mask, onto a second photoelectric cell. It comprises further an interferometer, the mobile portion of which is attached to the deflector, and the photoelectric cell of which emits counting impulses. And finally it comprises an auxiliary electronic device supplied by the second photoelectric cell as well as by the photoelectric cell of the interferometer, this auxiliary device sending to the electronic indication device counting impulses distributed over a field of measurement determined by said fixed mask.

3,724,960

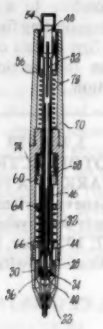
EVER-SHARP PENCIL WITH RETRACTABLE CORE PIPE

Yasuyuki Hashimoto, Nishinomiya, and Osamu Torii, Kyoto, both of Japan, assignors to Mitsubishi Pencil Co., Ltd., Tokyo, and Ancos Co., Ltd., Osaka, both of Japan

Filed Jan. 11, 1971, Ser. No. 105,292
Claims priority, application Japan, Jan. 10, 1970, 45/3034
Int. Cl. B43k *21/22, 21/20*
U.S. Cl. 401—67 4 Claims

In an ever-sharp pencil comprising two coupled body casings having a cap nozzle and a push means, a lead tube means

is retractably arranged in the cap nozzle and selectively operated by a release mechanism arranged in the middle of



the body casing without entailing any undesired extension of the lead.

3,724,961

WRITING DEVICE HAVING A RETRACTABLE WRITING ELEMENT

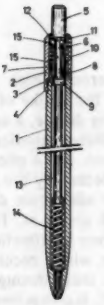
Jacques Levoin, Paradiso, Switzerland, assignor to Plastica Sudamericana, Buenos-Aires, Argentina

Filed Oct. 7, 1970, Ser. No. 78,867

Claims priority, application France, Oct. 10, 1969, 6934874

Int. Cl. B43k *5/16*

U.S. Cl. 401—110 **15 Claims**



A writing device comprising a retractable writing element equipped with a co-axial release spring and housed in a sheath topped with a push rod adapted to act directly on the upper end of the writing element. The sheath is formed by injection molding with an upper ring provided with a click tongue, the sheath and tongue being joined by a single breakable sprue of material the point of injection. The sheath is formed at its upper end with a cylindrical portion having a diameter smaller than that of the sheath but equal to the inner diameter of the ring. The device is provided with a push rod formed integral with diametrically opposed locking members adapted to cooperate with other locking member, also diametrically opposed, which are provided on the inner face of the small diameter portion at the upper end of the sheath, the locking members on one of the elements having two diametrically opposed stubs, formed on elastic tongues, which can be recessed and the locking members on the other element comprising two shaped cuts adapted to receive said stubs.

3,724,962

FOUNTAIN PEN

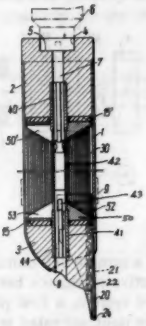
Heinz Gunther Herrnring, Hamburg-Fuhlsbuttel, Germany, assignor to Montblanc-Simplo GmbH, Hamburg, Germany

Filed March 15, 1971, Ser. No. 123,953

Claims priority, application Germany, March 14, 1970, P 20 12 266.1

Int. Cl. B43k *5/02*

U.S. Cl. 401—223 **22 Claims**



A fountain pen, in which the barrel of the pen includes an ink holding body in the form of a coiled up strip having webs on one face to hold the convolutions of the coiled up strip apart to create capillary passages. Ink can be supplied to the body from the pen end thereof or from the opposite end thereof. The body is held in the barrel of the pen between ink conducting bodies which interconnect the capillary spaces in the body and one of which communicates with the pen to supply ink thereto.

3,724,963

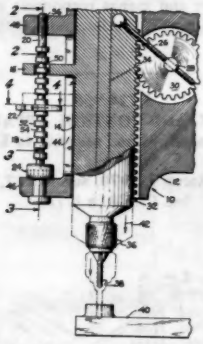
QUILL STOP AND GAUGE THEREFOR

Malcolm L. Stadtmiller, 1457 Ferguson Way, San Jose, Calif.

Filed Sept. 20, 1971, Ser. No. 181,963

Int. Cl. B23b *47/00*

U.S. Cl. 408—14 **7 Claims**



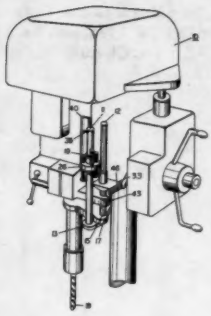
The disclosed embodiment of the present invention is a tool travel gauge which permits setting of one extreme limit of tool travel with respect to a workpiece. The gauge generally includes a member having a plurality of retaining surfaces thereon and spaced from one another along a longitudinal axis parallel to the tool feeding axis. A stop in the form of a clip is disposed for being received on any one of the retaining surfaces and is disposed for being engaged by an abutment mounted on the quill of the machine tool. Fine adjustment is provided by a micrometer screw which is adapted to move the member along its longitudinal axis with respect to the housing of the machine tool.

3,724,964

MULTIPLE STOP FOR POWER TOOLS

Andrew W. Needham, Jr., 141 E. 3350 S., Salt Lake City, Utah

Filed Jan. 22, 1971, Ser. No. 108,776
Int. Cl. B23b 49/00
U.S. Cl. 408—14 15 Claims



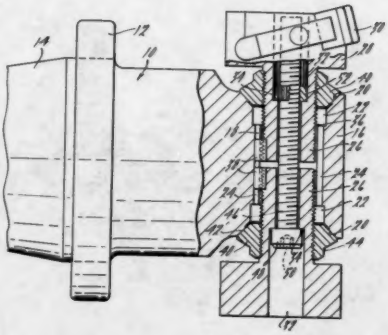
A shaft having a rotatable stop collar carrying adjustable stops is provided for a power tool, such as a drill press; it moves with the cutting tool, the stops being selectively registrable, optionally through an intermediate actuator, to bear against a stationary portion of the machine and/or an electrical limit switch for regulating depth of cut produced by the cutting tool.

3,724,965

DOUBLE BLADED CUTTING TOOL

George C. Green, Royal Oak, Mich., assignor to Devlieg Machine Company, Royal Oak, Mich.

Filed Aug. 25, 1971, Ser. No. 174,723
Int. Cl. B23b 29/02
U.S. Cl. 408—183 8 Claims



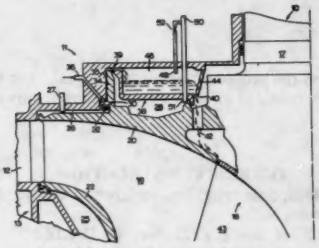
A tool holder having a pair of adjustable cutting blades. The blades are mounted on supports which project from the opposite ends of a transverse bore in the tool holder. The supports are individually adjustable in a direction radially of the tool rotational axis. A single screw holds both cutters in their adjusted positions.

3,724,966

HYDRAULIC MACHINE CROWN AERATION

Robert Stanley Sproule, Montreal, Quebec, Canada, assignor to Dominion Engineering Works, Limited, Lachine, Quebec, Canada

Filed June 14, 1971, Ser. No. 152,568
Claims priority, application Canada, July 29, 1970, 89425
Int. Cl. F03b 3/06
U.S. Cl. 415—1 9 Claims



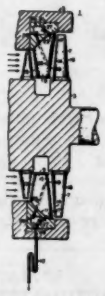
An aerated turbo-machine such as a Francis turbine utilizes a seal water receiving reservoir to separate air entrained with the seal water, for re-use in machine aeration.

3,724,967

MOISTURE REMOVAL DEVICE FOR A STEAM TURBINE

Frederick K. Fischer, Wawa, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 28, 1971, Ser. No. 193,345
Int. Cl. F01d 25/32, 15/00
U.S. Cl. 415—168 8 Claims



A row of stationary blades of the steam turbine having interconnecting cavities in the base portions thereof to form an annular chamber which cooperates with inlet and outlet ports disposed adjacent the trailing edges of these blades and adjacent the casing and rotor respectively to remove water and steam from the stationary blades, to separate the water and steam, and to direct the steam toward an adjacent row of rotating blades and the water to a drain.

3,724,968

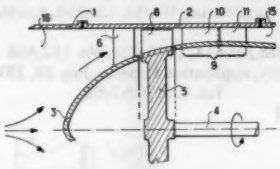
AXIAL SUPERSONIC COMPRESSOR

Jean-Marie Friberg, Bourg-la-Reine; Pierre Maginot, Paris, and Jean-Marie Merigoux, Palaiseau, all of France, assignors to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

Filed March 23, 1971, Ser. No. 127,095
Claims priority, application France, March 23, 1970, 7010383
Int. Cl. F04d 21/00, 29/44
U.S. Cl. 415—181 9 Claims

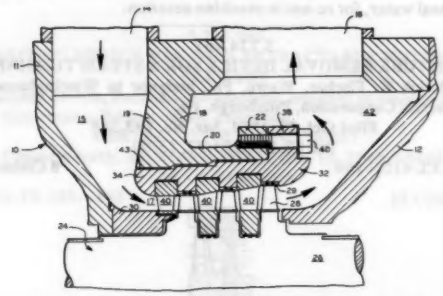
An axial supersonic fluid compressor has ducts incorporating both mobile and fixed blades that are designed to receive essentially normal shock waves. This is accomplished by having the angles of incidence upstream from the fixed and mobile blades relatively small; the passage cross sections of the

ducts between the blades of the mobile wheel convergent; the passage cross sections of the ducts between the fixed blades



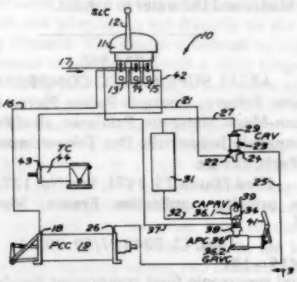
divergent, and the profile of the leading edges of the fixed and mobile blades rounded off with a small radius of curvature.

3,724,969
TURBINE CONSTRUCTION
Charles Shulock, Jeannette, Pa., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 1, 1971, Ser. No. 194,163
Int. Cl. F01d *1/02, 25/24, 25/26*
U.S. Cl. 415—190 **2 Claims**



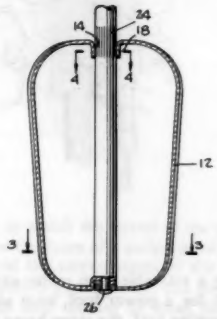
A turbine having a casing provided with an inwardly projecting partition equipped in turn with a rearwardly extending section terminating in a flange, a shroud ring having a forwardly extending portion underlying the rearward section of the partition is equipped with a flange at its rearward end for connection to the flange on the partition.

3,724,970
APPARATUS FOR AUTOMATIC PITCH COMPENSATION IN MARINE VESSELS
Jack R. Kobelt, 6110 Oak Street, Vancouver 13, British Columbia, Canada
Filed Feb. 23, 1971, Ser. No. 117,962
Int. Cl. B63h *3/10*
U.S. Cl. 416—27 **11 Claims**



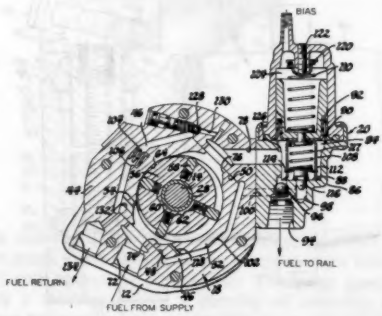
Pneumatic control circuit for marine vessel having controllable pitch propeller. Manual pneumatic signals of pitch and throttle are modified by automatic pitch compensator coupled to engine governor output, which senses changes in governor throttle demand, changes being a measure of change in engine load condition. Particular embodiments of automatic pitch compensators can be coupled to governor having output shaft of relatively high torque, or relatively low torque, or governor with hydraulic pressure ports.

3,724,971
BEATER AND METHOD FOR MAKING SAME
Hiroshi Yazawa, 1-14 Hokuryo-cho, Ohta-ku, Tokyo, Japan
Filed Oct. 20, 1971, Ser. No. 190,781
Int. Cl. B01f *7/24*
U.S. Cl. 416—227 **5 Claims**



An improved beater for home use and a method for making it are disclosed. A cross-like piece is formed with an opening through its hub and slipped over and attached between the ends of a thin shaft. The elongated arms of the cross-like piece form the blades which are bent and attached at the bottom of the shaft.

3,724,972
FUEL INJECTION PUMP
Donald G. Guetersloh, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 27, 1971, Ser. No. 211,934
Int. Cl. F04b *49/08*
U.S. Cl. 417—220 **7 Claims**

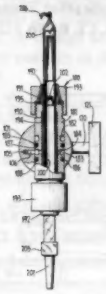


A fuel injection pump is located in a distributor housing which also contains a magnetic pickup for controlling fuel injection, a magnetic pickup for controlling ignition, and other ignition system components. The fuel injection pump is a variable displacement vane pump and has an accumulator and pressure regulator unit which maintains the fuel supplied to the injection nozzles at a constant pressure.

3,724,973
SURGICAL PUMP

Karl Shill, 38171 Asford Way, Fremont, Calif.

Filed Oct. 21, 1971, Ser. No. 191,207
Int. Cl. F04b *35/02*
U.S. Cl. 417—326 14 Claims

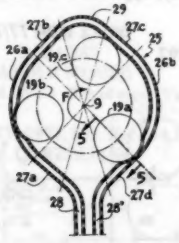


This invention relates to a surgical pump primarily designed for the pumping of blood, as in open-heart surgery or for pumping blood through a "kidney machine," but also particularly adapted for other surgical uses, such as pumping dialycate in a "kidney machine," or the like; and is characterized by the fact that it provides direct and continuous volumetric adjustment from 0 to the maximum size of the pump even while in use; is small in size and light-weight; is readily adjustable as to the force applied to the liquid being pumped, and has independently adjustable timing of the diastole and sistole portions of a pumping cycle.

3,724,974
PERISTALTIC PUMP

Robert Molimard, Chevilly-Larue, France, assignor to Laboratories Jacques Logeais, Issy Les Moulineaux, France

Filed Aug. 28, 1971, Ser. No. 175,129
Claims priority, application France, Aug. 28, 1970, 7031474
Int. Cl. F04b *43/08, 45/06*
U.S. Cl. 417—477 10 Claims

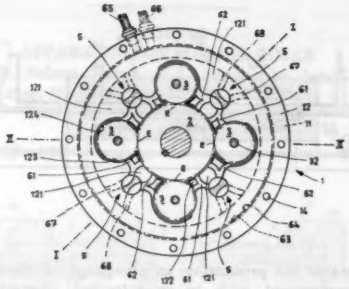


Peristaltic pump having an elastically yieldable pipe having a fixed configuration imparted thereto by a support ramp abutting the pipe. At least three rotatable rollers mounted on a rotor are made to travel in a closed path and alternately cause compression of the pipe against the support and decompression of the pipe. The path of the rollers, the spacing between the rollers and the configuration of the pipe are such that, when the downstream roller moves away from the pipe an upstream element already closes the pipe and causes the fluid to progress as the downstream roller causes a decompression of the pipe. The intermediate roller progressively compresses the pipe so as to ensure an exact volumetric compensation at each instant of the decompression due to the downstream roller by the compression due to the intermediate roller.

3,724,975
GEAR MOTOR OR PUMP

Konrad Bschorer, Wolfratshausen, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed April 19, 1971, Ser. No. 135,075
Claims priority, application Austria, April 27, 1970, 3834
Int. Cl. F01c *1/08*; F03c *3/00*; F04c *1/04*
U.S. Cl. 418—10 6 Claims

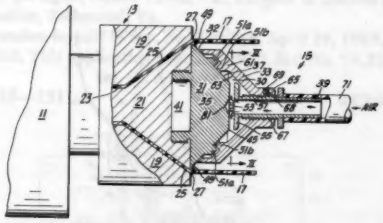


A multi-stage gear motor or pump utilizing a single central gear common to all stages and individual gears each cooperating with the central gear to provide the several stages. The individual gears are arranged equi-distantly from each other around and in engagement with the central gear. Portions of the housing extend between the individual gears to points close to the central gear to provide operating chambers adjacent each of the gear mesh points. Valving is arranged, preferably within the housing, to connect the operating chambers as desired, serially, parallel, by-passed or partially one and partially another. Where rotary valves are used, simple means can be provided for operating the valves simultaneously or successively from a single control.

3,724,976
FLUID DISTRIBUTOR FOR USE IN EXTRUDING FOAMED POLYMERIC MATERIALS

D. John Rode, Coraopolis, Pa., assignor to Sinclair-Koppers Company, Pittsburgh, Pa.

Filed Dec. 1, 1970, Ser. No. 94,000
Int. Cl. B29d *23/04*
U.S. Cl. 425—72 5 Claims



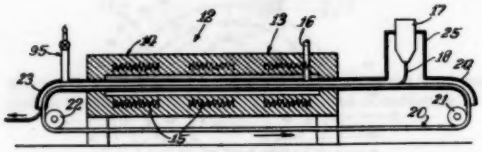
A distributor for directing a fluid onto the inside surface of a tubular extrudate of foamed polymeric material as the extrudate emerges from an annular die orifice of a conventional extruder to form a skin of unfoamed polymeric material thereon comprises a first member that is adjacent to and in coaxial alignment with the annular die orifice and a second member that is adjustably connected to the first member for axial movement therealong. Portions of the first and second members define an opening through which the fluid passes onto the inside surface of the tubular extrudate. Means for introducing the fluid from a source of supply to the opening is provided. The opening has impeding means disposed therein to create a fluid back pressure whereby an even pressure and an even flow of fluid is directed against the inside surface of the tubular extrudate.

3,724,977

REDUCING AND SINTERING FURNACE MEANS

Ernest U. Lang, Niles, Mich., assignor to National-Standard Company, Niles, Mich.

Continuation-in-part of Ser. No. 858,792, Sept. 17, 1969, abandoned. This application April 29, 1971, Ser. No. 138,694
Int. Cl. F27b *5/00, 9/28*
U.S. Cl. 425—72 15 Claims



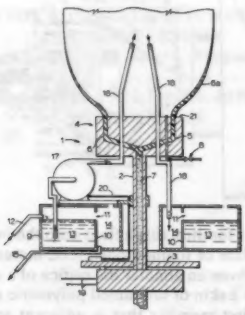
Apparatus for processing an elongated continuous green metal component, such as an extrusion, characterized by requiring sintering or reducing and sintering embodying conveyor means for receiving the continuous elongated component having an upper run for supporting the continuous elongated component without imparting force of a character to substantially change the configuration thereof as discharged from an extruder or other means for forming elongated continuous components for conveying through furnace means for sintering or reducing and sintering the elongated component and muffle means encasing the conveyor means affording atmospheric sealing of the protective gas for sintering or the reducing gas for reducing and sintering the elongated component.

3,724,978

ROTATABLE EXTRUSION APPARATUS

Raitis Lauge, Point Claire, Quebec, and Edward Raymond Hart, Pointe-aux-Trembles, Quebec, both of Canada, assignors to Union Carbide Canada Limited, Toronto, Ontario, Canada

Filed Oct. 27, 1971, Ser. No. 192,969
Int. Cl. B28b *21/36*
U.S. Cl. 425—86 3 Claims



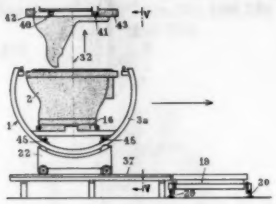
An apparatus for extruding thermoplastic film is disclosed which includes a fully rotational die and an internal cooling means. The die and internal cooling means is rotatable relative to a reservoir for cooling liquid positioned below the die and coaxial therewith. As the die rotates, inlet and outlet conduits of the internal cooling means trace a circular path through the reservoir.

3,724,979

INSTALLATION FOR MANUFACTURING CERAMIC BATHROOM PIECES

Robert Maringer, and Claude Cordelle, both of La Ferte Gaucher, France, assignors to Villeroy & Boch S.A., La Ferte Gaucher, France

Filed Dec. 23, 1971, Ser. No. 211,548
Claims priority, application France, Dec. 31, 1970, 7047573
Int. Cl. B28b *1/28, 15/00*
U.S. Cl. 425—88 5 Claims



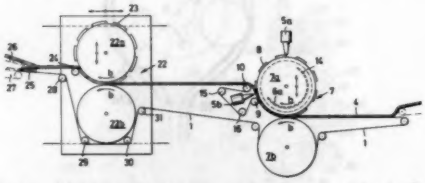
In an installation for the mass production of bathroom pieces such as toilets and bidets, of the type utilizing mould mounts comprising two wheels rotatably mounted in two parallel vertical planes, each wheel consisting of two unequal segments of which the minor one is adapted to be removed when said wheels have been rotated for causing the major segment thereof to bear on a cradle supporting the mount and slidably mounted in the direction of he planes of said wheels on a base plate provided with rollers enabling this plate to travel on a track perpendicular to the plane of said wheels, the piston of the mould, at the piston-release station, is lifted by a fork, rotated about one of its two pairs of pivot studs and deposited as a consequence of a downward movement of the fork upon a lateral conveyor directing the assembly to a waiting position close to the stripping station.

3,724,980

APPARATUS FOR CUTTING OUT FORMS FROM A RIBBON OF DOUGH

Heribert Lassmann, and Rudolf Woog, both of Kempen, Germany, assignors to Maschinenfabrik Briem-Hengler & Cronemeyer K.G., Krefeld, Germany

Filed Aug. 11, 1971, Ser. No. 170,825
Claims priority, application Germany, Dec. 19, 1970, P 20 62 745.6
Int. Cl. B29c *17/10*
U.S. Cl. 425—102 17 Claims



Apparatus for cutting out dough forms having inner cutouts from a ribbon of traveling dough. Parts of the apparatus include a first pair of rollers, a second pair of rollers spaced apart from the first pair and an endless carrier belt which supports the ribbon of dough and conveys it between each of the pairs of rollers. Each of the pairs of rollers is made up of a cutting roller, with punching elements around its periphery, and a contact pressure roller. The punching elements on the cutting roller of the first pair of rollers cut out the inner cutouts of the dough forms from the traveling ribbon of dough and the punching elements on the cutting roller of the second pair of rollers cut out the outer shapes of the dough forms.

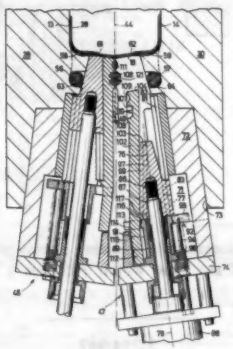
When the carrier belt conveys the ribbon of dough between each pair of rollers, the contact pressure roller is in pressure contact with the cutting edges of the punching elements of the cutting roller of that pair. The punching elements on the cutting roller of the first pair of rollers retain the inner cutouts of the dough forms as they roll away from contact with the ribbon of dough, and a blower positioned adjacent that roller blows these inner cutouts into the interior of the roller through openings in the roller wall. A trough shaped conveyor belt in the roller removes the inner cutouts as they accumulate during operation of the apparatus.

3,724,981

APPARATUS FOR MAKING A CONTAINER OF PLASTIC MATERIAL

Wolfram Schlemann, Eugen-Nagele Straase 17, 714 Ludwigsburg, Germany

Filed Nov. 16, 1971, Ser. No. 199,279
Int. Cl. B29d *23/03*
U.S. Cl. 425—109 **8 Claims**



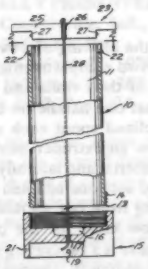
The apparatus makes a blow-moulded plastic container having three handles. Blow-moulding dies have open-edged recesses which are not undercut in the direction of the dividing plane between the dies. A separately moulded outer handle is insertable in each recess and becomes permanently welded to the container walls. Two sliding devices below the dies have recesses for forming the central handle and are movable towards each other and towards the dies, closing off central recesses therein.

3,724,982

CANDLE MOULD

Walter F. Davis, 4364 West Broadway, Vancouver, B.C., Canada

Filed May 17, 1971, Ser. No. 144,133
Int. Cl. B29d *31/00*
U.S. Cl. 425—117 **3 Claims**



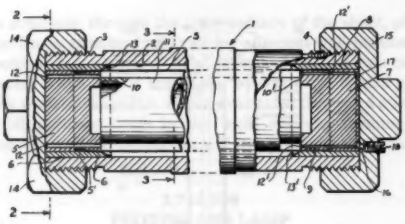
A candle mould having a barrel open at each end and a base having a threaded engagement with one end of the barrel forming a receptacle into which wax can be poured, the base having a central opening through which a wick can be threaded and a plug for sealing the opening. The barrel has diametrically opposed notches formed at its upper end serving as seats for holding a wick holder The wick holder has a central passage through which the wick can be threaded and maintained in position extending axially of the barrel while wax is poured therein.

3,724,983

APPARATUS FOR MAKING ROLLS

William B. Nelson, Sparta, N.J., assignor to Ames Rubber Corporation, Hamburg, N.J.

Filed Feb. 19, 1971, Ser. No. 116,883
Int. Cl. B29f *1/00*
U.S. Cl. 425—129 **7 Claims**



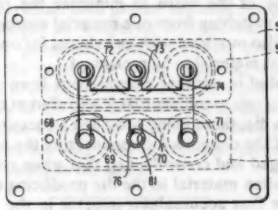
In the manufacture of metal cored elastomeric rolls having an outside protection sleeve, an extruded tubular sleeve of suitable material is placed in a mold having a cylindrical cavity of an inside diameter considerably in excess of the outside diameter of the sleeve, one end of the sleeve being anchored and the other end being free to move longitudinally. A cylindrical metal core is placed inside the sleeve and elastomeric material is then injected under pressure into the space between the core and the sleeve. The pressure stretches and expands the sleeve, forcing it into contact with the mold wall. The mold is then capped and heated to cure the elastomeric material.

3,724,984

EXTRUDER NOZZLE DISTRIBUTION PLATE WITH A PLURALITY OF VALVE CONTROLLED GROOVES

Thomas L. Jernigan, Center Cross, Va., assignor to Eskimo Pie Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 820,168, April 29, 1969, abandoned. This application Sept. 22, 1970, Ser. No. 74,329
Int. Cl. A23g *5/00*
U.S. Cl. 425—131 **4 Claims**



A method and nozzle assembly for producing confection bars severed from lengths of the confection in a plastic state that are extruded from a multiple compartmented nozzle assembly in which a distribution plate is fitted between the feed tube or tubes supplying the confection and nozzle assembly. The distribution plate contains passages which each lead from beneath the outlet end of the feed tube and extend across the plane of the plate to an aperture passing through the bottom of

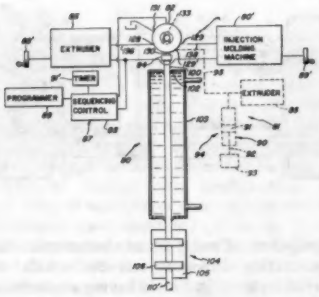
the plate into communication with each of the different nozzle compartments with the passage configured to control to the desired degree the amount of confection that flows to each of the multiple nozzle compartments.

3,724,985

EXTRUDING APPARATUS

Norbert W. Burlis, University City, Mo., and Joseph H. Corbett, Glens Falls, N.Y., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Jan. 18, 1971, Ser. No. 107,117
Int. Cl. B29d *23/04*
U.S. Cl. 425—132 7 Claims



An extruding apparatus for producing tubing having different characteristics, e.g. physical, chemical and the like, along its axial length including two or more molten plastic material producers that feed different molten materials to an extruding die, one molten plastic material producer being an injection molding machine or an extruder in combination with an accumulator injector. The two molten plastic producers are controlled so that when one producer is delivering molten material to the die producing a first section of the tubing, the other producer is either not injecting or exhausting to reclaimable waste.

A selectively operable valve is provided for delivering the molten materials to the die from one of the two sources having a fast cut-off characteristic effected by providing the inlets to the valve, connected to each of the molten material sources, and the valve outlet, connected to the extruding die, on one diametral side of the valve to minimize the required valve movement in switching from one material source to the other. The valve is also provided with an exhaust for one of the inlets permitting that material to be reclaimed.

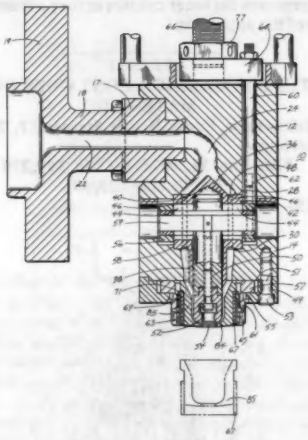
Also provided in another embodiment is an extruding apparatus having two extruders that feed different molten plastic materials to a die, there being provided an accumulator-injector in each of the conduits interconnecting the extruders with the die arranged and controlled so that when one extruder is delivering molten material to the die producing a first section of tubing, the first accumulator-injector in the conduit connecting the other extruder with the die withdraws molten plastic from that conduit. Thereafter, the first accumulator-injector injects the previously withdrawn molten material into the die, eliminating waste, while the second accumulator-injector withdraws the molten material emanating from its associated extruder. This cycle is reversed periodically to produce a tube having sections of different material without requiring a valve for draining the molten material from one of the extruders while the other feeds the die.

3,724,986

APPARATUS FOR PROTECTING AN EXTRUSION HEAD FROM OVER PRESSURE

Clayton A. Wheeler, Plainville, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 7, 1970, Ser. No. 78,741
Int. Cl. B29f *3/04*; B29d *23/04*
U.S. Cl. 425—154 6 Claims



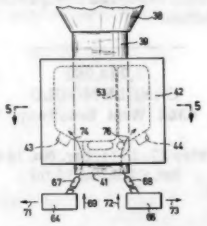
Means for automatically relieving excess pressure in an extrusion head of the type which includes a spider member therein.

3,724,987

APPARATUS FOR THE BLOWING OF A TWO-COMPARTMENT CAN

Wolfram Schiemann, Eugen-Nagele Strasse 17, 714 Ludwigsburg, Germany

Filed Nov. 12, 1971, Ser. No. 198,298
Int. Cl. B29d *23/03*
U.S. Cl. 425—326 3 Claims



An apparatus for the blowing of a two-compartment can of the type comprising two compartments, interconnected back-to-back in the area of their walls and facing one another in which there is at least one handle on the top side of the can and one radially inclined spout each on the top side of the compartments. Below an extruder extruding a single tube of hot thermoplastic material and laterally thereto there are provided two blow-mold sections adapted to be moved horizontally toward and away from one another and in closed condition to form the blow mold for the complete can. In each blow-mold section there is a separating wall with interior cooling, the wall corresponding in position and dimension to the slot between the compartments and being spaced in accordance with the thickness of the connecting strip between the compartments. In the plane of junction two inclined spin-

dle sleeves extend in accordance with the bisected apertures for the spouts in the blow-mold sections. The upper portions of the spindle sleeves are, in their position of closest proximity, closer to one another than the inner diameter of the tube and are positioned directly under the lower edge of the tube. The spindle sleeves are adapted to be moved outwardly and upwardly, pulling the extruded tube along, without the thus oppositely placed inner sides of the tube touching one another. The lower edge then extends to a length corresponding to approximately half the circumference of the tube and the upper portions of the spindle sleeves are placed in position for the bisected holes for the spouts and the apparatus in fully closed position of the blow-mold sections is then ready for blowing.

3,724,988

PRESSURE MOULDING MACHINE

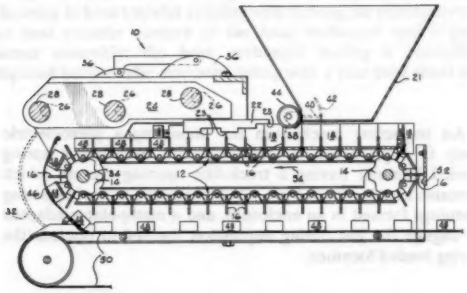
Wentzel Christoffel Gouws, 342 Main Reef Road. Wentworth Park, Krugersdorp, Republic of South Africa

Filed Oct. 4, 1971, Ser. No. 185,944

Claims priority, application South Africa, Oct. 7, 1970, 70/6842

Int. Cl. B30b *11/14*

U.S. Cl. 425—348 **9 Claims**



A pressure moulding machine which includes a plurality of open ended moulds each defined by a plurality of side and end walls relatively displaceable with respect to each other between one position being an article moulding position and another position being a moulded article discharge position. Each side wall of the mould is mounted on a driven carrier adapted to effect displacement of the side wall. Material charging means are provided for charging mouldable material into the open end of each mould. The machine also includes a cyclically operable ram member arranged to obturate the open end of each mould in succession thereby to compress the material charged into the moulds.

3,724,989

APPARATUS FOR FORMING ARTICLES COMPRISING A PAIR OF ADJACENT WALLED STRUCTURES UNIDIRECTIONALLY PRESENTED OPENINGS

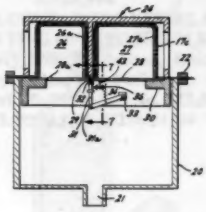
Norman F. Houghton, Connersville, Ind., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Division of Ser. No. 73,761, Sept. 21, 1970. This application Dec. 16, 1971, Ser. No. 208,962

Int. Cl. B29c *17/04*

U.S. Cl. 425—388 **6 Claims**

In a vacuum-forming operation, a pair of adjacent, side-by-side compartment liners are formed from a single sheet of thermoplastic material. A pair of adjacent molds, each having the desired shape of the inside surface of the corresponding liner to be formed, are mounted along their base portions on frame structure hinged in the region of adjacency of the mold base portions, to provide for pivotation of the base portions so that confronting surfaces of the molds are movable angularly toward and away from one another. A sheet of thermoplastic material is disposed to extend over the molds, and is heated, causing it to soften while the molds are held in pivoted position in which the confronting surfaces are substantially spaced from one another. Mold assist-plugs and the molds are then moved, relative to one another, to urge the sheet into general close conformity with the molds. While the sheet of material is still soft the assist-plugs further are caused to engage the mold



frame structure, through the intermediacy of the sheet, pivoting the frame structure and causing adjacent wall portions of the molds to move toward one another and assume their closely spaced position. Air entrapped between the heated sheet and the walls of the molds is then evacuated through a number of small ports or vents in the walls, thereby forming the desired liners which are cooled and stripped from the molds.

3,724,990

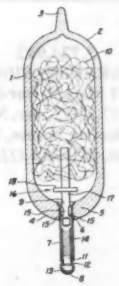
PHOTOFLASH LAMP

Lewis J. Schupp, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 15, 1971, Ser. No. 198,587

Int. Cl. F21k *5/02*

U.S. Cl. 431—93 **10 Claims**



A percussion-ignitable type flashlamp is disclosed which includes an improved primer material that is more stable in handling during lamp manufacture and improves performance of the lamp in operation. Said primer material comprises a mixture in percentages by weight of 4–50 percent phosphorus, 10–25 percent potassium chlorate, 4–10 percent sodium chlorate, and the remainder being titanium, which mixture can be bonded to form a unitary mass with a polyvinyl alcohol binder. A slurry of the primer material in an aqueous solution of 87–89 percent hydrolyzed polyvinyl alcohol remains substantially gel-free for long time periods and provides a tough and adherent coating in the lamp.

3,724,991

PHOTOFLASH LAMP

Lewis J. Schupp, Chesterland, Ohio, assignor to General Electric Company

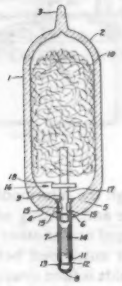
Filed Nov. 15, 1971, Ser. No. 198,547

Int. Cl. F21k *5/02*

U.S. Cl. 431—93 **10 Claims**

A percussion-ignitable type flashlamp is disclosed which includes an improved primer material that is more stable in han-

dling during manufacture of the lamp and improves performance of the lamp in operation. Said primer material comprises a mixture in percentages by weight of 4–50 percent phosphorus, 3–8 percent potassium chlorate, 6–30 percent potassium perchlorate, and the remainder being titanium,



which mixture can be bonded to form a unitary mass with a polyvinyl alcohol binder. A slurry of the primer material in an aqueous solution of 87–89 percent hydrolyzed polyvinyl alcohol remains substantially gel-free for long time periods and provides a tough and adherent coating in the lamp.

3,724,992

HEATING APPARATUS USING LIQUID FUEL

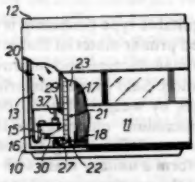
Jean-Jacques Camps, 51 Marcilly-sur-Seine, France

Filed Feb. 17, 1971, Ser. No. 116,020

Claims priority, application France, Feb. 17, 1970, 7005533

Int. Cl. F23d *11/36*

U.S. Cl. 431—154 **8 Claims**



A heating apparatus using liquid fuel, of the kind comprising a frame, a source of fuel such as a reservoir, a pump or a fuel intake, and a combustion chamber supplied with fuel through the intermediary of a constant-level tank, in which the source and the tank conjointly form a supply unit removably mounted in the frame, separable coupling means being provided between the supply unit and at least one pipe mounted on the said frame. The modified apparatus lends itself very rapidly to a standard replacement.

3,724,993

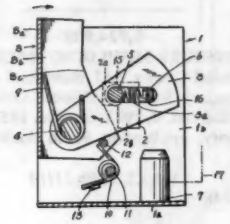
IMPACTING MECHANISM FOR IMPACTING A PIEZOELECTRIC BODY

Kenijiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaishya, Kawaguchi-shi, Saitama, Japan

Continuation of Ser. No. 85,328, Oct. 30, 1970, abandoned. This application Jan. 17, 1972, Ser. No. 218,452

Int. Cl. F23q *3/01*

U.S. Cl. 431—255 **14 Claims**



An impacting mechanism for impacting a piezoelectric body in a piezoelectric ignition device including a spring loaded hammer having a track-like opening therein which contains a spring loaded pin which engages a pair of opposing openings formed in an enclosure, and a manipulator adapted to engage the pin during depression thereof to operate the spring loaded hammer.

3,724,994

BURNER

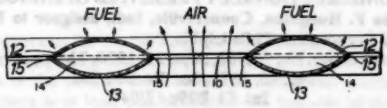
Denis Henry Desty, Weybridge, England, assignor to The British Petroleum Company Limited, London, England

Filed May 1, 1970, Ser. No. 33,672

Claims priority, application Great Britain, May 19, 1969, 25,419/69

Int. Cl. F23d *13/12*

U.S. Cl. 431—328 **5 Claims**



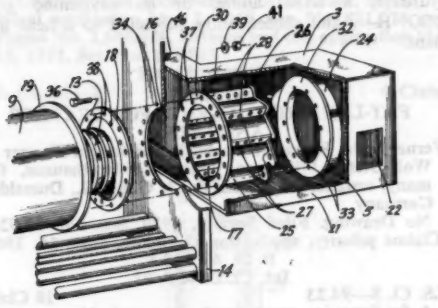
A burner for gaseous fuels, e.g. methane or hydrogen, has a porous exit sheet adjacent to a base plate. The two sheets are perforated to allow the passage of air, and fuel gas circulates between the sheets and around the perforations. The fuel passes through the porous sheet to burn with air passing through the perforations.

3,724,995

BURNER ASSEMBLY

Paul A. Mutchler, University City, Mo., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Nov. 24, 1971, Ser. No. 201,879
Int. Cl. F23d 13/40
U.S. Cl. 431—352 5 Claims



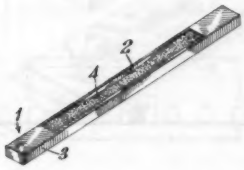
A gas-fired furnace including a heat exchanger mounted in a housing in heat transfer relation with flowing air passing over the heat transfer surface of the heat exchanger and a gas burner assembly; the heat exchanger having a centrally disposed burner tube communicating with a rear tube sheet at one end and the gas burner assembly at the opposite end, and a plurality of return tubes disposed about the burner tube and affixed to the rear tube sheet at one end and a flue gas collector at the opposite end.

3,724,996

BORON NITRIDE CONTAINING VESSEL HAVING A SURFACE COATING OF ZIRCONIUM SILICON

Lionel C. Montgomery, North Olmsted, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed March 12, 1971, Ser. No. 123,552
Int. Cl. F27d 5/00; F27b 21/04
U.S. Cl. 432—264 10 Claims



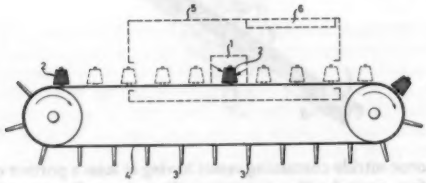
A boron nitride containing vessel having at least a portion of its surface coated with a zirconium silicon base alloy so as to render such surface readily wettable by molten metals such as aluminum.

CHEMICAL

3,724,997
PROCESS AND APPARATUS FOR SPACE-DYEING OF POLYESTER OR POLYAMIDE FIBRES OR THREADS

Hans-Ulrich von der Eltz, Frankfurt am Main, and Richard Gross, Munich, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Feb. 10, 1970, Ser. No. 9,680
Claims priority, application Germany, Feb. 12, 1969, P 19 06 840.7
Int. Cl. D06p *5/00*
U.S. Cl. 8—14 **4 Claims**



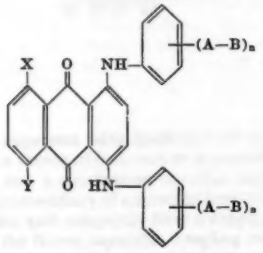
Process for the space-dyeing of wound-up polyester or polyamide fibres or threads by injection into the bobbins, being located on heated transporting equipment, disperse dyestuffs and/or organic pigment dyestuffs dissolved or dispersed in an organic solvent, at a temperature of from 160° to 230° C., and subsequently allowing the dyestuffs to take effect upon the textile material at the said temperature during 15 to 180 seconds to achieve fixation, and apparatus for carrying out said process.

3,724,998
CONTINUOUS DYEING OF POLYESTER FIBERS WITH WATER IMMISCIBLE ORGANIC SOLVENTS AND HYDROXY-PHENOL AMINO ANTHRAQUINONES

Gunter Gehrke and Volker Hederich, Cologne, Rutger Neeff, Leverkusen, and Peter Wegner, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 1, 1970, Ser. No. 77,342
Claims priority, application Germany, Oct. 8, 1969, P 19 50 679.7
Int. Cl. C09b *1/02*; D06p *1/20*
U.S. Cl. 8—39 **8 Claims**

The invention comprises a process for the continuous dyeing of synthetic fibre materials, e.g. polyester, polyamides, polyolefins and cellulose triacetate, from organic solvents. The fibre materials are impregnated with dye-liquors which contain anthraquinone dyestuffs of the formula



in which A represents a C—C bond or an oxygen atom, B stands for a C_1–C_6 alkyl, cycloalkyl or aralkyl radical, *n* is a number from 0 to 3, X denotes a hydrogen atom or a hydroxyl group, and Y stands for a hydrogen atom, a hydroxyl, a nitro, amino or an acylamino group RCONH—, and subsequently subjected to a heat treatment.

3,724,999
FAT-LIQUORING AGENTS FOR LEATHER AND SKINS

Werner Stein, Erkrath-Unterbach, and Jurgen Plapper and Wolf-Dieter Willmund, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

No Drawing. Filed Sept. 8, 1970, Ser. No. 70,526
Claims priority, application Germany, Sept. 16, 1969, P 19 46 723.3
Int. Cl. C14c *9/02*
U.S. Cl. 8—94.23 **10 Claims**

A fat-liquoring agent for leather and skins containing as an active substance at least 10% by weight, of total active substances, of a chlorination product of an ester of a higher fatty acid having from 8 to 24 carbon atoms, said chlorination product having a chlorine content of from 10% to 40% by weight and having substantially no free double bonds. The method of fat-liquoring and the fat-liquored leather and skins are also a part of the invention. The fat-liquoring agents of the invention have a good absorption on leather fibers as well as an excellent resistance to light and oxidation.

3,725,000
SPANDEX FIBER REACTED WITH ISOCYANATO GROUP CONTAINING SILOXANE

James K. Campbell and Martin C. Musolf, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of abandoned application Ser. No. 548,387, May 11, 1966. This application Mar. 22, 1971, Ser. No. 127,034
Int. Cl. D06m *3/26*; D06c *29/00*
U.S. Cl. 8—115.6 **14 Claims**

Spandex fibers are disclosed which have reacted therewith a lubricating finish which is a siloxane having the average general formula

$$R_n(CH_3)_{3-n}Si\{OSi(CH_3)_2\}_x\{OSi(CH_3)R\}_yOSi(CH_3)_{3-n}R_n$$

wherein R is a radical attached to the silicon atom via a non-hydrolyzable bond and contains at least one substituent that is reactive with the spandex fiber, each *n* is zero or one, *x* and *y* are integers, and the ratio of solely methyl substituted silicon atoms to R substituted silicon atoms is in the range of 15–300:1. These spandex fibers have a permanent finish which is not harmful to the physical properties of the fiber, which will not migrate, and which has a significantly reduced tendency to discolor the fiber.

3,725,001
PHOSPHINIDYNETRIMETHANOL TRIACETATE AND ITS APPLICATION TO CELLULOSIC MATERIALS

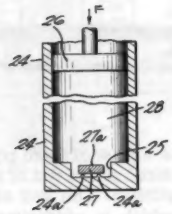
Sigred B. Lanoux, Lafayette, Samuel E. Ellzey, Jr., New Orleans, and George L. Drake, Jr., and Wilson A. Reeves, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Aug. 21, 1970, Ser. No. 66,084
Int. Cl. D06m *13/34*
U.S. Cl. 8—189 **5 Claims**

Phosphinidynetrimethanol triacetate was prepared by reacting tetrakis(hydroxymethyl)phosphonium chloride

with acetic anhydride in pyridine at room temperature. Cotton and other cellulosic textiles were treated with the product produced by the new process and found flame retardant.

3,725,002
METHOD FOR STERILIZATION
James M. Wolf, Ann Arbor, Mich., assignor to Chemotronics, Incorporated, Ann Arbor, Mich.
Original application May 2, 1969, Ser. No. 821,276, now Patent No. 3,606,996. Divided and this application Mar. 18, 1971, Ser. No. 125,863
Int. Cl. A61l *1/00*
U.S. Cl. 21—2 **4 Claims**



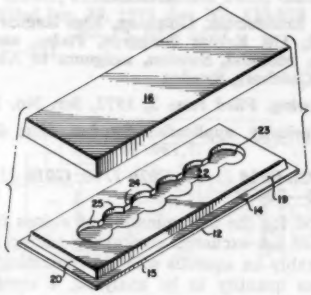
A method for the sterilization of surfaces utilizing essentially instantaneous and transient thermal pulses generated in a gaseous medium in contact with the surfaces by means of ignition of an explosive gas mixture or by adiabatic compression. The thermal pulses have a duration of less than about one second so that the surface is not damaged. The surface to be treated is substantially free of liquid material so that the thermal pulse acts directly upon the microorganisms.

3,725,003
METHOD OF STERILE PACKAGING
Francis C. Moore and Leon R. Perkinson, Indianapolis, Ind., assignors to Moore-Perk Corporation, Indianapolis, Ind.
No Drawing. Continuation-in-part of application Ser. No. 873,786, Nov. 4, 1969, now Patent No. 3,618,283. This application Feb. 4, 1971, Ser. No. 112,762
Int. Cl. A61l *13/00*
U.S. Cl. 21—58 **28 Claims**

A method of sterile packaging which involves the steps of partially filling a container with any of a number of anti-bacterial agents in liquid or semi-liquid form, then sealing the container so that an air space is formed above the liquid within the container, and finally heating the container and its contents (which may include a solid object to be sterilized immersed or partially immersed in the liquid) to a temperature substantially below the boiling point of the liquid, and at a pressure of about one atmosphere, until the interior surfaces of the container above and below the liquid level, and the entire contents of such container, are sterilized.

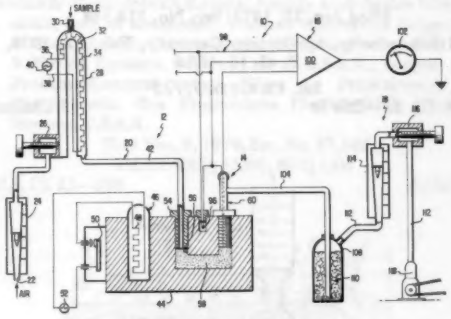
3,725,004
GEL DIFFUSION DEVICE
Stanley R. Johnson, Fountain Valley, and Sheldon H. Forel, Redondo Beach, Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Dec. 21, 1970, Ser. No. 99,797
Int. Cl. C12k *1/04;* **G01n** *31/02, 33/16*
U.S. Cl. 23—230 B **16 Claims**

A shallow receptacle having at least one recess therein for holding a gel medium for performing biochemical determinations by a technique known as radial gel diffusion. The sidewalls of the recess possess arcuate indentations to provide a series of bay-like areas. The shallow receptacle is provided with a cover which has



a top that is displaced from the top surface of the shallow receptacle when the cover is placed over the shallow receptacle.

3,725,005
ANALYSIS OF REACTIVE MATERIALS IN GAS STREAMS
William B. Innes, 724 Kilbourne Drive, Upland, Calif. 91786
Continuation-in-part of applications Ser. No. 658,786, Aug. 7, 1967, and Ser. No. 748,109, June 3, 1968, now Patent No. 3,537,823. This application Nov. 3, 1970, Ser. No. 86,481
The portion of the term of the patent subsequent to Nov. 3, 1987, has been disclaimed
Int. Cl. G01n *31/10, 31/12, 33/22*
U.S. Cl. 23—232 E **12 Claims**



A method and apparatus for determining the amount of reactive constituents in a gas sample is disclosed. Air is mixed with a sample and passed through a suitable oxidation catalyst for oxidizing the constituent. The temperature rise in the catalyst is proportional to the concentration of the constituent in the sample and is measured immediately adjacent the inlet to the bed. The temperature of the air and sample is maintained above the dew point thereof to prevent condensation of water and

absorption of reactable components therein. Provisions are made to prevent sorption of reactable components in the inlet line upstream of the reactive bed.

3,725,006

METHOD FOR QUANTITATIVE DETERMINATION OF ANIONS

Arne Elof Brandstrom, Goteborg, Klas Ragnar Gustavii, Molndal, Ulf Krister Junggren, Pixbo, and Kerstin Kylberg, Molndal, Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

No Drawing. Filed June 3, 1971, Ser. No. 149,766

Claims priority, application Sweden, June 4, 1970, 7,790/70

Int. Cl. B01d *11/04;* **C02b** *1/60;* **G01n** *31/04*
U.S. Cl. 23—230 R **17 Claims**

A method for the determination of anions in solution by means of ion exchange comprising adding to a solution, preferably an aqueous solution containing an anion in unknown quantity to be analyzed, a compound selected from the group consisting of quaternary aliphatic ammonium picrates having a total of at least 30 carbon atoms, preferably dissolved in an immiscible organic solvent, thereby to form by ion exchange the corresponding quaternary ammonium compound of said anion to be analyzed and to release a corresponding amount of picrate anion. Suitably two layers are formed upon mixing and the quaternary ammonium compound of said unknown anion becomes dissolved in the organic solvent, while said released picrate ion becomes dissolved in the aqueous phase. Known techniques such as optical methods are employed to determine the amount of released picrate ion, which is a measure of the amount of original unknown anion to be analyzed.

3,725,007

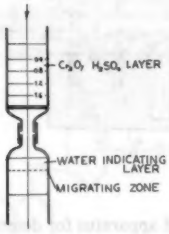
TEST TUBE FOR THE QUANTITATIVE DETECTION OF THE ALCOHOLIC STRENGTH OF RESPIRATORY AIR AND METHOD FOR THE PREPARATION OF SAID TUBE

Erwin F. Kral and Dieter Eschrich, Bad Lanpeusaka, Germany, assignors to VEB Jenapharm, Jena, Germany

Filed Jan. 28, 1971, Ser. No. 110,548

Claims priority, application Germany, Feb. 17, 1970, P 42 11 455.6

Int. Cl. G01n *31/22*
U.S. Cl. 23—254 R **5 Claims**



A test tube for the quantitative detection of the alcohol content of breath by means of bichromate-sulphuric acid. The test tube contains a carrier material consisting of silica-gel powder bonded to glass particles and saturated with a reagent for indicating the alcohol content. The test tube is provided with a scale in the region of the reagent for indicating the alcohol content for the determination by linear colorimetric means of the amount of alcohol contained in the breath.

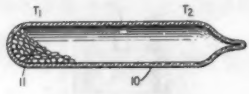
3,725,008

METHOD OF REGROWING CRYSTALS OF CADMIUM SULPHIDE FOR SCINTILLATION COUNTERS

Robert Michael Mikulyak, Stirling, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed May 18, 1970, Ser. No. 38,344

Int. Cl. B01d *7/00;* **C01g** *11/00*
U.S. Cl. 23—294 **7 Claims**



In order to regrow a mass of small crystals of cadmium sulphide, they are placed at one end of a sealed evacuated tube (10^{-5} torr typically). This end of the tube is held at a temperature which is approximately equal to or slightly greater than the sublimation temperature of the cadmium sulphide crystals, while the other end of the tube is held at a still higher temperature. Thereby, the mass of small crystals is regrown at the same tube site under conditions of solid-vapor equilibrium, and in effect coalesced into larger crystals which are useful as scintillation phosphors to detect gamma rays of the order of 100 kilovolt or more.

3,725,009

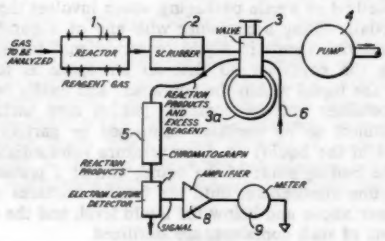
DETECTION OF TRACE GASES UTILIZING AN ELECTRON CAPTURE DETECTOR

James Ephraim Lovelock, Bowerchalke, near Salisbury, England

Filed June 23, 1969, Ser. No. 835,346

Claims priority, application Great Britain, June 24, 1968, 30,079/68; June 4, 1969, 28,314/69

Int. Cl. G01n *23/12*
U.S. Cl. 23—232 C **18 Claims**

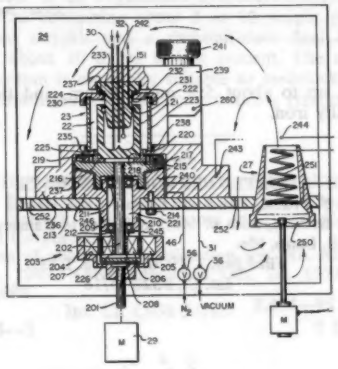


Method and apparatus for the detection of trace gases, such as for example atmospheric contaminants. A gas sample suspected of containing a contaminant is introduced into a reactor containing a reagent which converts the contaminant into an electron absorber. The presence of the contaminant is detected by passing the effluent from the reactor through an electron capture detector. If the gas sample contains oxygen then it is desirable to separate the oxygen from the stream entering the detector.

3,725,010
APPARATUS FOR AUTOMATICALLY PERFORMING CHEMICAL PROCESSES

Harry A. Penhasi, Cupertino, Calif., assignor to Beckman Instruments, Inc.

Continuation of abandoned application Ser. No. 814,425, Apr. 8, 1969. This application Aug. 23, 1971, Ser. No. 174,211
Int. Cl. G01n 1/18, 9/30
U.S. Cl. 23—253 R 16 Claims

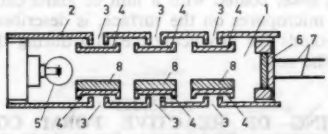


An automatic protein-peptide sequenator for determining the amino acid sequence in proteins and/or peptides containing N number of amino acid units including: an easily accessible reaction cell disposed within a reaction chamber having a minimum volume and rotationally driven by a variable or multiple speed motor through a magnetic coupling drive unit, air-circulating heating means, a constant pressure and uniform delivery system including vacuum and solenoid actuated valve assemblies, a regulated inert gas supply system, an evacuated fraction collector, and a programming control unit which may be automatically or manually manipulated.

3,725,011
AUTOMATIC FIRE ALARM WITH AT LEAST ONE MEASURING CHAMBER

Gustav A. Purt, Rapperswil, and Walter Bosshard, Stafa, Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed Mar. 13, 1970, Ser. No. 19,244
Claims priority, application Switzerland, Mar. 28, 1969, 4,747/69
Int. Cl. G01n 21/26, 23/12; G08b 21/00
U.S. Cl. 23—254 E 16 Claims

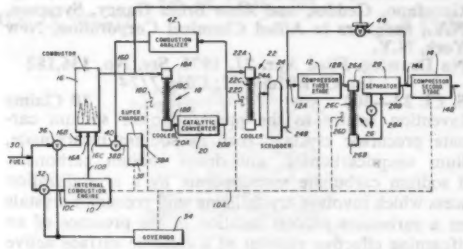


An automatic fire alarm possessing at least one measuring chamber accessible to the surrounding air and constructed such that it can deliver by means of an electric circuit an alarm signal when combustion products, in the form of combustion aerosols or smoke, penetrate the measuring chamber. According to the invention the measuring chamber contains a solid or liquid substance which, in the course of time, gives off a gaseous reaction agent suitable for forming with hydrogen halide vapors condensation products in the form of aerosols.

3,725,012
APPARATUS FOR MANUFACTURING HIGH PRESSURE INERT GAS

George H. Gower, 6120 S. Kingston, Tulsa, Okla. 74135

Filed Jan. 27, 1971, Ser. No. 110,028
Int. Cl. B01j 7/00
U.S. Cl. 23—281 6 Claims

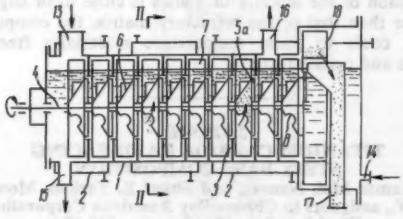


An internal combustion engine, at least one compressor attached to and driven by the engine, a combustor to which the exhaust of the engine is conducted along with gas and air which is burned in the combustor, a high temperature air cooled heat exchanger having an inlet header, an outlet header, and finned tube communicating between the headers, the gas outlet from the combustor passing through the heat exchanger, a fan for passing ambient air between the finned tube for cooling the gas output of the combustor, a catalytic converter through which the gas is passed before passing to the compressor, high pressure inert gas being delivered at the compressor outlet.

3,725,013
MULTISECTION APPARATUS WITH CONVEYING MEANS FOR CARRYING OUT MASS-EXCHANGE PROCESSES IN SOLID-LIQUID SYSTEMS

Alexandr Alexandrovich Kavepa; Anatoly Anatolievich Nitkovskikh, both of Krasnodar; Vladimir Andreevich Grigoriev, Moscow; Arkady Borisovich Pashkov, Moscow, and Yakov Vulfovich Epshtein, Moscow, all of U.S.S.R., assignors to Proektno-Konstruk-torskoe Bjuro po Proektirovani ju Oborudovania dlya Proizvodstva Plasticheskikh Mass i, Moscow, U.S.S.R.

Filed Nov. 9, 1970, Ser. No. 87,945
Int. Cl. C08g 35/00; B01j 1/08
U.S. Cl. 23—285 4 Claims



An apparatus, which comprises a cylindrical casing divided by partitions into sections and accommodating a shaft with

mixing devices, said devices being made as dishes that are rigidly fixed on said shaft and arranged within each said section, buckets being attached to the outside of said dishes; each of said dishes being provided with at least one aperture in the space defined by one of said buckets, and at least one of the other of said buckets having an aperture in the bottom portion thereof.

3,725,014
SODIUM CARBONATE CRYSTALLIZATION PROCESS WITH FOAM PREVENTION

Rustom Pestonji Poncha, Camillus, Norman Rutledge Garofano, Geddes, and Alan Brian Gancy, Syracuse, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Apr. 21, 1971, Ser. No. 136,182
Int. Cl. B01d *9/02;* **C01d** *7/24*
U.S. Cl. 23—300 **20 Claims**

Invention relates to the preparation of sodium carbonate precursor crystals, such as sodium bicarbonate, sodium sesquicarbonate, anhydrous sodium carbonate, and sodium carbonate monohydrate by a crystallization process which involves crystallizing said precursor crystals from a carbonate process solution in the presence of an antifoaming effective amount of a cationic surface active agent and separating the crystals formed from the mother liquor.

3,725,015
PROCESS FOR FORMING HIGH DENSITY REFRACTORY SHAPES AND THE PRODUCTS RESULTING THEREFROM

Gerald Q. Weaver, Princeton, Mass., assignor to Norton Company, Worcester, Mass.

No Drawing. Filed June 8, 1970, Ser. No. 44,624
Int. Cl. B22f *3/26*
U.S. Cl. 29—182.1 **9 Claims**

A process for fabricating low porosity, essentially defect free, composite refractory shapes of novel composition. A powdered refractory material is mixed with a carbon containing substance and the mixture is cold formed into a desired shape; the preformed shape is then heat treated to convert the carbon containing substance to carbon. A molten metal bath is prepared, comprised of at least two metals, at least one of which is capable of reacting with the carbon in the preformed shape, and the combination of which results in a metallic mixture greater than that of the refractory material making up the matrix of the preformed shape. The perform is then heated and impregnated with the molten metal which results in sintering of the refractory material matrix, and the reaction of at least one of the metals with the carbon contained in the interstices formed by the particulate refractory material, to form metal carbide(s) therein. The composite shape is then removed from the molten metal bath and cooled. Because the coefficient of thermal expansion of the mixture of metals is close to or slightly greater than that of the refractory matrix, the composite shape cools to room temperature essentially free of cracks and residual stress.

3,725,016
TITANIUM CARBIDE HARD-FACING STEEL-BASE COMPOSITION

M. Kumar Mal, Nanuet, and Stuart E. Tarkan, Monsey, N.Y., assignors to Chromalloy American Corporation

Filed Jan. 24, 1972, Ser. No. 220,074
Int. Cl. B22f *1/00*
U.S. Cl. 29—182.3 **7 Claims**

A titanium carbide hard-facing steel-base composition is provided consisting essentially by weight of about 10% to 75% titanium carbide, and steel-forming matrix ingredients making up essentially the balance, the matrix being formed of up to about 20% chromium, about 1% to 5% boron, about 2% to 8% silicon, about 1.5% to 5%

carbon, up to about 5% molybdenum, and the balance essentially iron.

3,725,017
COATED NERVOUS SUBSTRATE

Herbert F. Prasse, Town and Country, and Harold E. McCormick, Ballwin, both of Mo., assignors to Ramsey Corporation, St. Louis, Mo.

Filed Jan. 7, 1970, Ser. No. 1,187
Int. Cl. B32b *15/18*
U.S. Cl. 29—196.6 **8 Claims**

This invention relates to an alloy useful as a hard facing material. The alloy comprises a matrix such as a nickel-chromium matrix containing a separate interstitially boron-hardened tungsten phase. The alloy is used as a facing or coating for a number of base materials, and in particular as a piston ring facing. The invention is also concerned with a method of making said alloy by utilizing a plasma jet spray technique.

3,725,018
FORM COKE COATED WITH GLANZ CARBON AND METHODS OF PRODUCTION

Robert T. Joseph, Richboro, Pa., assignor to FMC Corporation, New York, N.Y.

Filed Apr. 19, 1971, Ser. No. 134,982
Int. Cl. C10l *5/00, 5/36*
U.S. Cl. 44—10 R **4 Claims**

Form coke, coated with a film of glanz carbon which fills the micropores on the surface, is described, together with methods for producing the film during the production of the coke.

3,725,019
COATING OF REACTIVE FORM COKE BY CATALYTIC DEPOSITION OF GLANZ CARBON

Anthony P. Zanpirri, Oreland, Pa., Jack Trechock, Woodbury Heights, N.J., and Robert T. Joseph, Richboro, Pa., assignors to FMC Corporation, New York, N.Y.

No Drawing. Filed Apr. 19, 1971, Ser. No. 135,379
Int. Cl. C10l *5/00, 5/36*
U.S. Cl. 44—10 R **5 Claims**

Form coke, coated with a uniform film of glanz carbon, is described, together with methods for producing the film during the production of the coke by the catalytic action of transition metals, especially tin and zinc.

3,725,020
FUEL COMPOSITION FOR PRODUCING SYNTHESIS GAS OR FUEL GAS

William L. Slater, La Habra, and John C. Ahlborn, Pomona, Calif., assignors to Texaco Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 719,229, Apr. 5, 1968. This application Aug. 5, 1970, Ser. No. 61,396

Int. Cl. C10l *1/00, 1/18*

U.S. Cl. 44—50 1 Claim

Improved fuel composition comprising about 1 to 80 weight percent of an oxygenated hydrocarbonaceous organic material containing about 5 to 60 weight percent of combined oxygen and a carboniferous fuel in the amount of about 20 to 99 weight percent. The subject fuel composition is especially suitable as feedstock for a partial oxidation gas generator for producing synthesis gas or fuel gas.

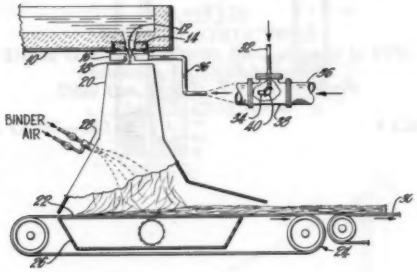
3,725,021
METHOD OF PRODUCING GLASS FIBERS

Robert G. Trout, Prairie Village, Kans., and Charles J. Stalego, Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation

Continuation of abandoned application Ser. No. 837,528, June 30, 1969. This application Oct. 20, 1971, Ser. No. 190,999

Int. Cl. C03b *33/06*

U.S. Cl. 65—3 7 Claims



Method and apparatus for producing mats of glass fibers that are attenuated by high velocity gases and wherein a mist of a water solution of water soluble glass lubricant such as ethylene glycol, is applied to the fibers, either during their attenuation by the high velocity gases, or prior thereto.

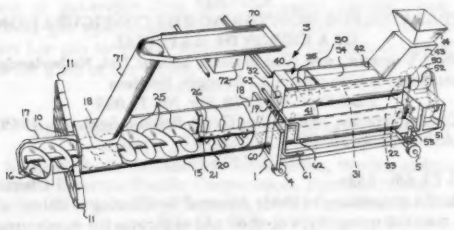
3,725,022
METHOD OF FEEDING GLASS BATCH

Harry N. Mills, Toledo, Ohio, and Henry E. Roll, Waco, Tex., assignors to Owens-Illinois, Inc.

Filed Feb. 12, 1971, Ser. No. 114,917

Int. Cl. C03b *3/00*

U.S. Cl. 65—27 7 Claims



Method and apparatus for controllably and homogeneously combining and controllably feeding preselected amounts of a homogeneous blended mass of liquid and dry glass batch materials into a glass melting furnace. The foregoing is effected by the use of a mixing and feeding device which employs a paddle blade mixing and conveying device which communicates with a screw conveyor device in a common chamber into which the liquid and dry materials are independently introduced.

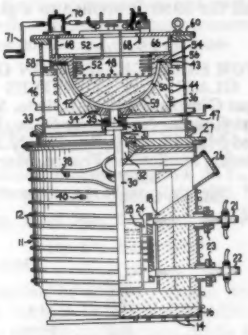
3,725,023
PRESSURE MOLDING OF GLASS ARTICLES

Joseph N. Parris, Irwin, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 21, 1970, Ser. No. 82,768

Int. Cl. C03b *7/00*

U.S. Cl. 65—72 8 Claims



Pressure forming glass sheets, in particular solid hemispheres, by casting molten glass upward under superatmosphere pressure between graphite molds while the molds are maintained within a desired temperature range below a temperature at which molten glass adheres to graphite and above a temperature at which the molds cause chill cracking and optical defects in the surfaces of the cast glass.

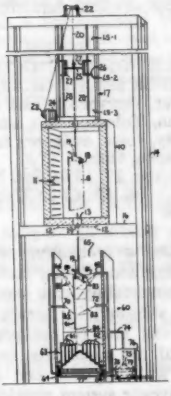
3,725,024
TEMPERING GLASS SHEETS WITH LIQUID FLOWS

Lowell L. Sperry, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 21, 1971, Ser. No. 108,661

Int. Cl. C03b *27/00*

U.S. Cl. 65—114 16 Claims



Thermal treatment of glass sheets, particularly to impart a controlled thermal temper that is approximately

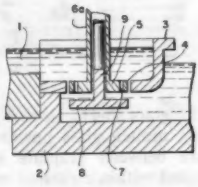
unchanging from sheet to sheet, on a high speed, mass production basis in such a manner that each glass sheet so treated has acceptable optical properties. The present invention obtains this desired result by a so-called flood quenching, which comprises applying a plurality of continuous or approximately continuous flows of a liquid selected for its heat exchange properties across the entire surface of the sheet and removing the flows of liquid from contact with the sheet after the liquid has moved across the surface of the sheet and has cooled the sheet sufficiently to impart a thermal temper of the desired magnitude. A novel type of glass gripping tongs is provided to minimize any interference with free movement of the liquid flows that would be expected from using tongs. Means is provided to avoid top edge breakage and means is provided to minimize bubbles entrapped within the tempering liquid when the latter is applied to a glass surface.

3,725,025

METHOD FOR HOMOGENIZATION OF MOLTEN GLASS AND ADDITIVES

German Artigas Gimenez, Aviles, Oviedo, Spain, assignor to Saint-Gobain, Neuilly-sur-Seine, France

Filed May 13, 1970, Ser. No. 22,254
Claims priority, application France, Mar. 25, 1969, 6908758
Int. Cl. C03b *5/16, 5/18*
U.S. Cl. 65—134 **5 Claims**



Method and apparatus for the homogenization of molten glass and additives thereto, flowing in the feeder channel of a glass-melting furnace. The glass flow is broken up into a multiplicity of small vertical streams or filaments which are then re-combined by and between two closely-spaced horizontal superposed surfaces. The upper surface may be a disk rotating about a vertical axis and comprising a multiplicity of apertures through which the molten glass flows. The lower surface may be fixed, or a disk rotatable as a unit with the upper disk, or independently but coaxially in the opposite direction, or in the same direction but at speed different from the upper disk.

3,725,026

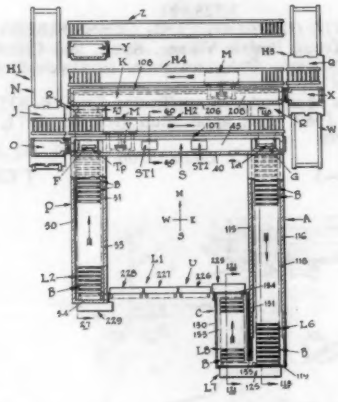
APPARATUS FOR PRODUCING ALL-GLASS MULTIPLE SHEET GLAZING UNITS

Robert P. Roetter, Perrysburg, and Alfred H. Miller and John D. Quinn, Toledo, Ohio, and John M. Crosman, Jr., Mason City, Iowa, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Apr. 27, 1970, Ser. No. 32,320
Int. Cl. C03c *27/00*
U.S. Cl. 65—156 **29 Claims**

Apparatus for producing all-glass multiple sheet glazing units including a preheating section, a sealing section and annealing and cooling sections. The preheating section and the annealing and cooling sections are located in spaced, substantially parallel relation to one another with the exit end of the preheating section and the entry end of the annealing section being in open communication with opposite end areas of the sealing section. One conveyor system provides a horizontal, substantially continuous rectangular path of movement for carrying a plurality of support means for glass sheets through the preheating section to raise the temperature of the glass sheets above the point of strain. Each support means is then carried to an area in which it is positioned to receive a completed glazing unit to convey the same through the annealing and cooling sections to an unloading area where the glazing unit is removed from the support means. Another pair of sheets to be formed into a glazing unit are then placed on the support means and moved into the entry end of the preheating section.

A second conveyor system provides a second horizontal, substantially continuous rectangular path of movement in a plane in parallel with and above the first conveyor system for moving a plurality of carrier means



for the glass sheets through the sealing section, to form them into a completed glazing unit, with means for then transferring each empty carrier means for movement along a return section arranged in spaced parallel relation to the sealing section. The return section includes transfer means to deliver the carrier means to the entry end of the sealing section.

As herein provided, the sequences of movement of the sheet support means and of the carrier means are automatically controlled and interlocked to also effect vertical lifting of a pair of sheets from a support means to a carrier means positioned thereabove and eventual vertical lowering of a finished glazing unit from the carrier means to a supporting means therebeneath.

3,725,027

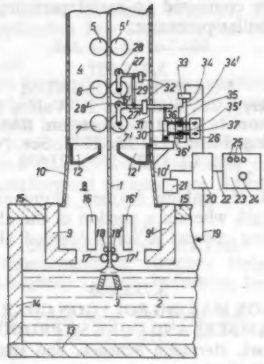
APPARATUS FOR MONITORING THE CONFIGURATION OF A RIBBON OF MATERIAL

Robert Toussaint, and Elzo Mulder, both of Tiel, Netherlands, assignors to Glaverbel S.A., Brussels, Belgium

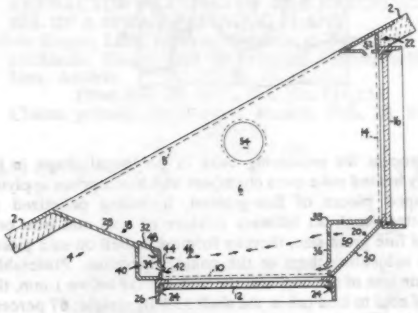
Filed Sept. 10, 1970, Ser. No. 71,029
Claims priority, application Great Britain, Sept. 10, 1969, 44,650/69; July 29, 1970, 36,764/70
Int. Cl. C03b *15/02*
U.S. Cl. 65—158 **11 Claims**

In the processing of sheet material by drawing a ribbon of the material upwardly, a method and apparatus for monitoring deflections experienced by the material out of the vertical plane along which it is normally drawn by providing sensing components near, and normally out of contact with, opposite

faces of the ribbon and by arranging the components to produce an output indication in response to a change in a physical condition of the region adjacent the component due to such deflection.



3,725,028
WINDOW STRUCTURE
Deane G. Cramer, Festus, Mo., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Oct. 1, 1971, Ser. No. 185,499
Int. Cl. C03b *18/00*
U.S. Cl. 65—182 R **4 Claims**



Disclosed is a float-bath window structure that yields long-term clear viewing upbath and downbath from its location. The structure comprises first and second panes set at about 90 degrees with respect to each other, first sets of gas-outlet slots near the panes having vanes to direct gas against the glass, and second sets of slot outlets for gas to create second sets of gas curtains parallel to the glass of the panes.

3,725,029
PREPARATION OF AMMONIUM SULFATE FERTILIZER CONSTITUENT
Kenneth A. E. Blackmore, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.
No Drawing. Filed Sept. 27, 1971, Ser. No. 184,296
Int. Cl. C05c *9/00*
U.S. Cl. 71—28 **9 Claims**

A fertilizer constituent of ammonium sulfate for dried fertilizer blending is prepared by granulating the ammonium sulfate in a drum granulator using a concentrated lignosulfonate solution as a binder, coating the granulated particles of ammonium sulfate with molten urea to have the urea solidify upon the surface of the ammonium sulfate particles, and contacting the coated particles with a dry powder as an anti-caking agent.

3,725,030
LIMITING PLANT GROWTH WITH HETEROCYCLIC ALKYLTHIOCYANATE AND ISOTHIOCYANATE
Peter E. Newallis, Leawood, Kans.; Albert J. Poje, Grandview, Mo., and Peter F. Epstein, Prairie Village, Kans., assignors to Chemagro Corporation, Kansas City, Mo.
Filed Nov. 20, 1970, Ser. No. 91,541
Int. Cl. A01n *5/00*
U.S. Cl. 71—76 **5 Claims**

Plant growth limiting compositions and methods of limiting vegetative growth with non-phytotoxic concentrations using certain alkylthiocyanates and isothiocyanates.

3,725,031
HERBICIDAL COMPOSITIONS AND METHODS OF PREPARING THEM
Leslie L. Balassa, Blooming Grove, N.Y., assignor to Balchem Corporation, Slate Hill, N.Y.
No Drawing. Filed Jan. 24, 1969, Ser. No. 793,912
Int. Cl. A01n *5/00*
U.S. Cl. 71—105 **4 Claims**

The combination of certain resinous and/or wax-like materials with various agricultural herbicides in an inert, porous carrier reduces the leaching of the herbicide from the upper 10 cm. of soil and losses of herbicide due to volatilization and thus increases the effective field life of the herbicide.

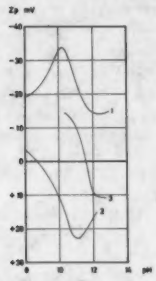
3,725,032
METHOD FOR AGGLOMERATING ORE CONCENTRATE AND RESULTANT PRODUCT
Per Gudmar Kihlstedt, Bromma, Sweden, assignor to AB Cold Bound Pellets, Djursholm, Sweden
Filed Dec. 16, 1969, Ser. No. 885,614
Claims priority, application Sweden, Dec. 20, 1968, 17614/68
Int. Cl. C21b *1/24*
U.S. Cl. 75—3 **7 Claims**

A method for agglomerating finely-divided starting material containing at least one chemically bound metal which is to be reduced out in a metallurgical process in which there is used a slag whose silicon content is higher than that of the slag forming components of the starting material, wherein the starting material is mixed with a finely-divided binder, consisting mainly of silica, and the mixture is formed into agglomerates which are maintained for from 1 to 48 hours in an atmosphere consisting mainly of steam at a temperature of 160° – 230°C and a pressure of 10 – 70 atmospheres above atmospheric.

3,725,033
AGGLOMERATING MOIST PARTICULATE MATERIAL BY ADJUSTING THE ZETA-POTENTIAL TO ZERO
Per Gudmar Kihlstedt, Bromma, Sweden, assignor to AB Cold Bound Pellets, Belestigen, Djursholm, Sweden
Filed May 19, 1970, Ser. No. 38,856
Claims priority, application Sweden, May 27, 1969, 7,391/69
Int. Cl. C21b *1/08*; C22b *1/28*; B01l *1/02*
U.S. Cl. 75—3 **7 Claims**

A method in pelletizing processes for agglomerating moist particulate material, the method comprising the

steps of neutralizing or removing the electric charge of individual constituent particles to prevent the repulsion



of said particles by each other, thereby to provide a firmly packed agglomerate.

3,725,034

METHOD OF PRODUCING CARBON AND IRON-CONTAINING BRIQUETTES

Robert T. Joseph, Richboro, Pa., and Josiah Work, Harlingen, Tex., assignors to FMC Corporation, New York, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,559

Int. Cl. C21b *1/28*; C22b *1/24*

U.S. Cl. 75—4 **4 Claims**

A novel composite briquette useful in producing iron is made by briquetting a reactive coal calcinate made as described in Work et al. U.S. Pat. Nos. 3,140,241 and 3,140,242, and iron oxide, with a bituminous binder, using proportions to insure at least 50 percent carbon plus hydrogen by weight, then curing the briquettes in the presence of a gas containing at least 5 percent of oxygen at briquette temperature of 450° to 575°F, and then further heating the cured briquettes at 1600° to 1800°F, whereby at least 90 percent of the iron is reduced. The briquette is distinguished by consisting of iron particles embedded and evenly distributed through a uniform solid carbonaceous structure.

3,725,035

PROCESS FOR MAKING GOLD POWDER

Oliver A. Short, and Richard V. Weaver, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 15,212, Feb. 27, 1970, abandoned. This application July 2, 1971, Ser. No. 159,486

Int. Cl. C22b *11/04*

U.S. Cl. 75—.5 A **19 Claims**

A process for producing precipitated gold powder comprised of gold flakes, gold spheres or mixtures thereof by reducing a gold salt solution with selected reducing agents, in the presence of a protective colloid, at an elevated temperature. The process parameters provide a means for controlling the size and shape of the precipitated gold powder which has specific applications in the decorative and/or electronics industries (i.e., metallizing compositions).

3,725,036

PROCESS FOR MAKING SMALL PARTICLES

John E. Ehrreich, Wayland, and Adrian R. Reti, Cambridge, Mass., assignors to Graham Magnetics, Inc., Graham, Tex.

No Drawing. Filed Mar. 24, 1971, Ser. No. 127,850

Int. Cl. B22f *9/00*; H01f *1/06, 1/09*

U.S. Cl. 75—.5 A **15 Claims**

A process for making metallic particles of sub-micron particle size wherein a soluble metallic salt is reacted with a strong reducing agent in a solvent medium which, in addition to the aforesaid reactants, comprises a silane solute which has a strong chemical affinity for the newly-formed metallic surface. The invention also encompasses products formed by the aforesaid process, e.g. iron and cobalt powders characterized by a surprisingly high bulk density when compared to metal particles prepared by somewhat similar processes.

3,725,037

FOAMED ALUMINUM

Currie B. Berry, Jr., and Alex R. Valdo, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

No Drawing. Filed Feb. 25, 1971, Ser. No. 118,973

Int. Cl. C22c *1/06, 21/00*

U.S. Cl. 75—20 F **7 Claims**

A method of making foamed aluminum having increased strength wherein a portion of the aluminum used in the foaming process is scrap foamed aluminum.

3,725,038

PROCESS FOR MAKING POLYGON COKE IN COKING CHAMBERS AND COKE SO PRODUCED

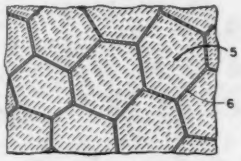
Werner Wenzel, Hermann Schenck, and Heinrich-Wilhelm Gudenau, all of Aachen, Germany, assignors to said Wenzel and Schenck, by said Gudenau

Filed Jan. 18, 1971, Ser. No. 107,231

Claims priority, application Germany, April 14, 1970, P 20 17 816.9

Int. Cl. C21b *1/10*; B01j *2/12*; C22b *1/14*

U.S. Cl. 75—46 CA **2 Claims**



A process for producing coke in polygonal shape in indirectly heated coke oven chambers which comprises applying to shaped pieces of fine-grained, including pelletized or briquetted, coal, an intimate mixture of coal and iron ore, both of fine grain-size, thereby forming a shell on said pieces before subjecting them to the coking operation. Preferably, the grain size of the coal and the iron ore are below 1 mm, the ratio of coal to iron ore in the shell 33% by weight: 67 percent by weight. The invention also comprises the polygonal coke made by the process.

3,725,039

RECOVERY OF NICKEL CONCENTRATES FROM LATERITE ORES

Tage L. B. Jepsen, Gabbs, Nev., assignor to Basic Incorporated, Cleveland, Ohio

No Drawing. Filed Dec. 10, 1970, Ser. No. 96,951

Int. Cl. C22b *1/08*

U.S. Cl. 75—2 **11 Claims**

A process is disclosed for the recovery of nickel concentrates from laterite ores by segregation roasting wherein the ore after drying for removal of at least part of the free water is mixed with a chloridizing agent and a carbonaceous reductant, such as coal or coke, before roasting. This mixture is heated to temperatures of 900° to 1050° C. while maintaining a slightly reducing atmosphere. Preferred chloridizing agent is a mixture of sodium chloride and calcium oxide. The resulting sinter is subjected to suitable concentration for final nickel recovery.

3,725,040

METHOD OF OPERATING A VARIABLE FLAME OXY-FUEL BURNER

Robert D. Jones, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Original application May 28, 1968, Ser. No. 733,100, now Patent No. 3,578,793, dated May 18, 1971. Divided and this application July 23, 1970, Ser. No. 63,995
Int. Cl. C21c 7/00
U.S. Cl. 75—60 4 Claims

An oxy-fuel burner for use in a metallurgical furnace is disclosed which can be controlled to regulate the configuration of the burner flame to provide a flame shape varying from a wide "umbrella" shaped flame to a narrow "pencil" shaped flame. Several methods of using such burners in metallurgical furnaces are also disclosed.

3,725,041

DEOXIDIZING METAL

Sundaresan Ramachandran, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Sept. 25, 1970, Ser. No. 75,738
Int. Cl. C21c 7/06
U.S. Cl. 75—60 10 Claims

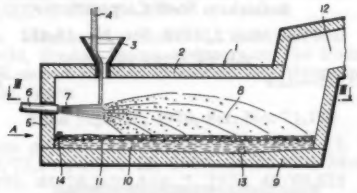
A method of deoxidizing metal while maintaining the carbon content of the metal at a level about equal to or lower than the level prior to deoxidizing. It comprises the steps of introducing hydrocarbon deoxidizer and diluent gas into a vessel containing molten metal, determining the effect of the hydrocarbon deoxidizer and diluent gas upon the carbon content of the metal and controlling the proportion of hydrocarbon deoxidizer to diluent gas so that the average rate of carbon leaving the vessel is about equal to or greater than the average rate of carbon being introduced into the vessel.

3,725,042

METHOD FOR IMPROVING THE LIFE OF THE REFRACTORY LINING OF THE REFINING VESSEL OF A SPRAY REFINING PLANT

Alois Hager, Linz, Austria, assignor to Vereinigte Oesterreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Feb. 17, 1971, Ser. No. 116,118
Claims priority, application Austria, Feb. 20, 1970, 1,555/70
Int. Cl. C21c 7/00
U.S. Cl. 75—60 4 Claims



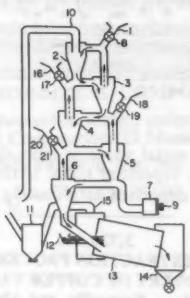
The invention relates to a method for improving the life of a refractory lining of a refining vessel of a spray-refining plant in which a pig iron stream running in vertical direction into the refining vessel designed as a hearth of long extension is atomized by at least one refining gas jet which is blown in about horizontally under formation of a spraying cone, comprising introducing cooling air on both sides of the spraying cone along both side walls of the refining vessel. By this provision the spraying cone is kept away from the side walls of the refining vessel. Further advantages gained are that the refining gas consumption is reduced and that the course of the reaction progresses more calmly because the occurrence of whirls in the area of the spraying cone is prevented.

3,725,043

METHOD FOR SEGREGATING METALS CONTAINED IN THE OXIDE ORES THEREOF

Tadashi Kawai and Hideaki Kenma, Tokyo, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1971, Ser. No. 119,101
Claims priority, application Japan, May 26, 1970, 45/44,492
Int. Cl. C21c 7/00
U.S. Cl. 75—72 9 Claims



A method for obtaining a concentrated metal-containing product from metal oxide ore wherein the oxide ore is preheated in a preheating zone and the preheated ore is contacted with a halogenating agent and a reducing agent in a reaction zone to react therewith, in which oxide ore is flowed through a preheating zone consisting of at least two cyclones connected in series, parallel or combinations thereof, passing a hot gas free of any exhaust gas from the reaction zone in surface contact with said oxide ores in the preheating zone, flowing continuously the thus preheated ores into the reaction zone while substantially preventing the atmosphere of the preheating zone from entering the reaction zone and withdrawing the exhaust gas generated in the reaction zone therefrom.

3,725,044

METHOD OF CONTINUOUS PROCESSING OF SULFIDE ORES

Toshikazu Morisaki, and Kazuo Tachimoto, both of Tokyo-to, Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 1, 1969, Ser. No. 881,226
Claims priority, application Japan, Dec. 7, 1968, 43/89818
Int. Cl. C22b 15/06, 15/14
U.S. Cl. 75—74 4 Claims

A continuous processing of sulfide ores in utilization of a combination of smelting, slagging, and blister furnaces, or of smelting and blister furnaces.

3,725,045

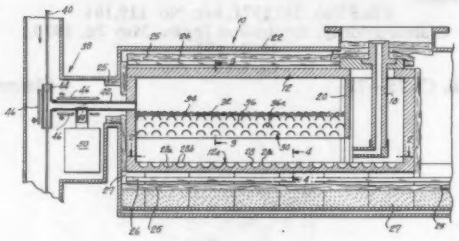
APPARATUS AND METHOD FOR VAPORIZING MOLTEN METAL

John M. Roblin, Cleveland, and Frank J. Cole, Parma, Ohio, and James G. Bourne, Winchester, Mass., assignors to Republic Steel Corporation, Cleveland, Ohio

Filed June 24, 1970, Ser. No. 49,370
Int. Cl. C22b 7/00, 9/00, 19/04
U.S. Cl. 75—93 28 Claims

Apparatus and method for vaporizing molten metal without entrainment of liquid droplets includes providing a pool of molten metal in a chamber having plural parallel elongated grooves forming a scalloped bottom portion, the bottom and sides of each groove being rounded. The top of the pool of molten metal is maintained at a level just above or below the tops of the grooves. The metal in the grooves is heated to generate vapor. To remove any

droplets from the metal vapor it is passed through a baffle defining a tortuous path and then through a filter made of a felt material that is non-reactive with the metal



vapor. When the metal vapor is zinc, the felt material is graphite felt. The vaporized metal is then removed from the chamber and deposited as a coating on a substrate.

3,725,046

SOLVENT EXTRACTION PROCESS FOR THE RECOVERY OF COPPER VALUES

James Albert Hartlage, Burnsville, and Alvin Dale Cronberg, Bloomington, both of Minn., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 22, 1971, Ser. No. 117,826

Int. Cl. C22b *15/08*

U.S. Cl. 75—101 BE **7 Claims**

The coalescence rate of an aqueous/liquid hydrocarbon emulsion system is enhanced by the presence of an alkylated phenol as a minor part of the organic phase. Such hydrocarbon solutions further containing a chelation metal collector can be advantageously employed in the liquid ion exchange process for the extractive recovery of metal values from dilute aqueous solutions thereof.

3,725,047

RECOVERY OF NOBLE METALS

Michael Schneider, Munich, Germany, assignor to Girdler-Sudchemie Katalysator G.m.b.H., Munich, Germany

No Drawing. Filed June 2, 1971, Ser. No. 149,374

Claims priority, application Germany, June 4, 1970, P 20 27 477.5

Int. Cl. C22b *61/00*

U.S. Cl. 75—108 **5 Claims**

Noble metals, particularly metals of the platinum group and gold are separated from other materials in aqueous acidic solution by precipitation in elemental form by reaction with an alkene or other compound containing a C—C double bond, in the presence of an oxidizing agent such as oxygen.

3,725,048

VALVE SEAT MATERIAL FOR AN INTERNAL COMBUSTION ENGINE

Soichiro Honda, Tokyo, Yoshitoshi Hagiwara, Yamato-machi, and Kenya Motoyoshi, Itami-shi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, and Sumitomo Denki Kogyo Kabushiki Kaisha, Higashi-ku, Osaka-shi, Japan

No Drawing. Filed Sept. 14, 1971, Ser. No. 180,467

Claims priority, application Japan, Sept. 15, 1970, 45/80,841

Int. Cl. C22b *9/00;* **C22c** *39/54*

U.S. Cl. 75—122 **3 Claims**

A valve seat of an internal combustion engine is composed of an alloy of 0.3–20% by weight of lead, 5–45% by weight of copper or copper oxide, 0.2–4% by weight of carbon, the balance being iron.

3,725,049

SEMI-SKILLED HIGH TENSILE STRENGTH STEELS

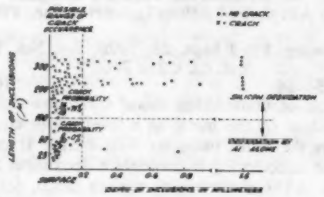
Susumu Satoh, Muroran, Hideki Tanaka, Tokyo, and Shujiro Ono and Hiroshi Horiguchi, Muroran, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of abandoned application Ser. No. 617,112, Feb. 20, 1967. This application Aug. 12, 1970, Ser. No. 63,307

Claims priority, application Japan, Mar. 11, 1966, 41/15,060; July 21, 1966, 41/47,892

Int. Cl. C22c *39/26, 39/54*

U.S. Cl. 75—123 D **5 Claims**



Semi-killed steel composition exhibiting high tensile strength and containing manganese and at least one of the metals columbium and vanadium while being devoid of large non-metallic inclusions. The semi-killed steel composition is characterized in that it has been deoxidized by aluminum alone whereby the formation of inclusions of manganese silicate larger than 100μ is avoided. Further, the alumina inclusions formed by the aluminum deoxidation are not larger than 100μ. There is little tendency toward crack formation in articles manufactured from the instant steel composition.

3,725,050

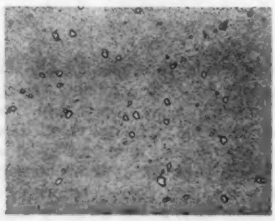
COLD WORK DIE STEEL

John Y. Riedel, Bethlehem, Pa., assignor to Bethlehem Steel Corporation

Filed Mar. 2, 1970, Ser. No. 15,482

Int. Cl. C22c *39/14*

U.S. Cl. 75—126 **2 Claims**



A malleable cold work die steel containing large amounts of titanium carbides in a matrix of tempered martensite.

3,725,051

METHOD OF PURIFYING LOW-CARBON FERROCHROME

Cecil George Chadwick, Lewiston, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Oct. 14, 1970, Ser. No. 80,811

Int. Cl. C22c *1/06, 39/14*

U.S. Cl. 75—130.5 1 Claim

Method for lowering the nitrogen, carbon and oxygen content of ferrochromium alloy by heating the alloy under vacuum.

3,725,052

NON-MAGNETIC RESILIENT MANGANESE-COPPER ALLOY HAVING A SUBSTANTIALLY TEMPERATURE-FREE ELASTIC MODULUS

Hakaru Masumoto, Shohachi Sawaya, and Michio Kikuchi, Sendai, Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Sendai, Japan

Filed Sept. 10, 1970, Ser. No. 71,189

Claims priority, application Japan, Sept. 13, 1969, 44/72,548, 44/72,549; Mar. 13, 1970, 45/20,805; Aug. 18, 1970, 45/71,724

Int. Cl. C22c *33/00, 39/00*

U.S. Cl. 75—134 M 24 Claims

Non-magnetic resilient manganese-copper alloys having a temperature coefficient of Young's modulus in a range of -20×10^{-5} to $+20\times10^{-5}$, essentially consisting of 30 to 95 wt. percent of manganese, less than 70 wt. percent of copper, and 0 to 38 wt. percent of one or more optional sub-ingredients selected from the group consisting of 0 to 38 wt. percent of iron, molybdenum, tungsten, indium, and titanium, 0 to 30 wt. percent of nickel, 0 to 27 wt. percent of vanadium, gold, silver, and tantalum, 0 to 25 wt. percent of cobalt, 0 to 24 wt. percent of zirconium, palladium, cadmium, germanium, chromium, selenium, bismuth, samarium, niobium, antimony, aluminum, silicon, tin, tellurium, and gadolinium, and 0 to 10 wt. percent of zinc, beryllium, and boron.

3,725,053

NON-MAGNETIC RESILIENT MANGANESE-NICKEL ALLOY HAVING A SMALL TEMPERATURE COEFFICIENT OF ELASTIC MODULUS AND METHOD FOR MANUFACTURING THE SAME

Hakaru Masumoto, Shohachi Sawaya, and Michio Kikuchi, Sendai, Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Sendai, Japan

Filed Sept. 10, 1970, Ser. No. 71,190

Claims priority, application Japan, Sept. 13, 1969; 44/72,547; Nov. 18, 1969, 44/91,904; Mar. 11, 1970, 45/20,349; Aug. 7, 1970, 45/68,625

Int. Cl. C22c *33/00, 39/00*

U.S. Cl. 75—134 M 25 Claims

Non-magnetic resilient manganese-nickel alloys having a temperature coefficient of Young's modulus in a range of -20×10^{-5} to $+20\times10^{-5}$, essentially consisting of 40 to 95 wt. percent of manganese, less than 40 wt. percent, preferably 5 to 40 wt. percent of nickel, and 0 to 32 wt. percent in total of optional subingredient or subingredients selected from the group consisting of 0 to 32 wt. percent of chromium, 0 to 30 wt. percent of iron, molybdenum, tungsten, indium, and titanium, 0 to 20 wt. percent of cobalt, vanadium, gold, silver, tantalum, zirconium, palladium, cadmium, germanium, selenium, bismuth, samarium, niobium, antimony, aluminum, silicon, tin, tellurium, and gadolinium, and 0 to 10 wt. percent of zinc, beryllium, and boron.

3,725,054

ALUMINUM-MOLYBDENUM-TITANIUM MASTER ALLOY

Frederick H. Perfect, Wyomissing, Pa., assignor to Reading Alloys, Inc., Robesonia, Pa.

No Drawing. Filed Aug. 30, 1971, Ser. No. 176,322

Int. Cl. C22c *21/00*

U.S. Cl. 75—134 F 1 Claim

This invention relates to master alloys containing about 35 to 50% molybdenum, about 6.5 to 15% titanium, balance aluminum, and not more than about 0.1%, by weight, oxygen, which are used in preparing titanium base alloys.

3,725,055

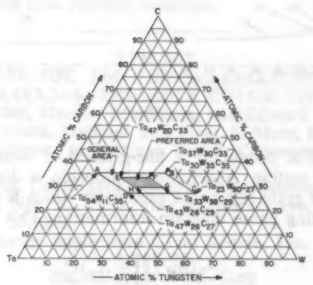
CARBIDE-METAL COMPOSITES

Erwin Rudy, Beaverton, Oreg., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed July 29, 1970, Ser. No. 59,064

Int. Cl. C22c *29/00*

U.S. Cl. 75—134 F 23 Claims



This patent describes a refractory metal-bonded carbide alloy for use in cutting tools and in other applications where high hardness and abrasion resistance are required. The desired fine-grained composite structure is obtained by the disproportionation of a precursor $(Ta,W)_2C$-based subcarbide phase into a monocarbide and a metal alloy phase. The precursor subcarbide phase originates from ternary or higher order alloys of refractory transition metals and carbon. Consolidation of the composites can be accomplished by melting and casting or powder metallurgy techniques.

3,725,056

ALUMINUM BRONZE ALLOY HAVING IMPROVED MECHANICAL PROPERTIES AT ELEVATED TEMPERATURES

Quentin F. Ingerson, Wauwatosa, Wis., assignor to Ampco-Pittsburgh Corp., Milwaukee, Wis.

No Drawing. Filed Feb. 25, 1971, Ser. No. 119,001

Int. Cl. C22c *9/00*

U.S. Cl. 75—154 4 Claims

An aluminum bronze alloy having high resistance to intergranular oxidation and improved ductility at elevated temperatures. The alloy comprises from 5 to 8% by weight of aluminum, from 1.6 to 2.9% by weight of iron, from 0.005 to 0.69% by weight of tin, silver or mixtures thereof, from 0.02 to 0.14% vanadium, from 0.05 to 0.5% by weight of zirconium and the balance copper. In the

alloy composition the vanadium and zirconium cooperate to provide improved ductility as well as strength at elevated temperatures.

3,725,057

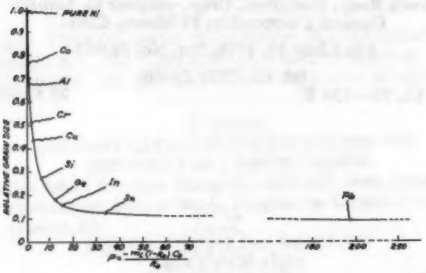
GRAIN SIZE OF METAL CASTINGS

Lemuel A. Tarshis, Latham, and James L. Walker, Schenectady, N.Y., assignors to General Electric Company

Continuation-in-part of application Ser. No. 882,512, Dec. 5, 1969. This application Sept. 21, 1971, Ser. No. 182,406

Int. Cl. C22c 1/02

U.S. Cl. 75—170 **6 Claims**



Method of producing a fine-grained or changed grain size alloy casting. A definite relationship is disclosed between cast grain size and a parameter which is obtainable from existing phase diagram information. This parameter is

$$P=\frac{-(m_L)(1-K_o)C_o}{K_o}$$

wherein m_L is the liquidus line slope, K_o is the solute distribution coefficient, and C_o is the bulk composition in terms of atomic percent of the grain size refining additive.

3,725,058

DUAL LAYERED PHOTORECEPTOR EMPLOYING SELENIUM SENSITIZER

Yoshiki Hayashi, and Masanaru Hasegawa, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 30, 1969, Ser. No. 889,118

Int. Cl. G03g 5/02

U.S. Cl. 96—1.5 **13 Claims**

An electrophotographic photosensitive plate is composed of an electrically conducting plate having adjacent thereto a vitreous selenium layer, said layer having adjacent thereto a layer of organic photoconductive insulating material which is substantially non-light sensitive in the visible ray region.

3,725,059

METHOD OF CLEANING AN ELECTROSTATO-GRAPHIC IMAGING SURFACE

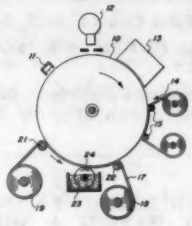
Richard J. Komp, Bowling Green, Ky., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 19, 1969, Ser. No. 886,634

Int. Cl. G03g 13/14, 13/22

U.S. Cl. 96—1.4 **10 Claims**

An electrostatographic imaging system wherein the imaging surface is cyclically cleaned of residual nonaqueous liquid developer by contacting the imaging surface with a cleaning liquid which is miscible with the nonaqueous liquid developer to dissolve substantially all residual liquid developer. Removal of the miscible cleaning liquid and dissolved liquid developer from the imaging surface may be accomplished with a thin



film of liquid being permitted to remain on the imaging surface for every cycle.

3,725,060

HEMATEIN OR HEMATOXYLIN-CONTAINING ZINC OXIDE PHOTOCONDUCTIVE LAYERS

Masaaki Taimoto, and Satoru Honjo, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sept. 24, 1971, Ser. No. 183,706

Int. Cl. G03g 5/08

U.S. Cl. 96—1.7 **4 Claims**

An electrophotographic layer composed of a zinc oxide photoconductor, a resinous binder and at least one compound selected from hematein and hematoxylin.

3,725,061

METHOD OF PRODUCING AND USING A PHOTO-CONDUCTIVE RECORDING MEDIUM

Karel Verhille, Mortsel-Antwerp, and André Jan Conix, Antwerp, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

No Drawing. Continuation-in-part of application Ser. No. 872,424, Oct. 29, 1969, which is a continuation of application Ser. No. 560,844, June 27, 1966, both now abandoned. This application June 11, 1971, Ser. No. 152,442

Claims priority, application Great Britain, June 25, 1965, 27,129/65

Int. Cl. G03g 5/08

U.S. Cl. 96—1.8 **6 Claims**

A method of producing an electrophotographic recording material, which comprises

(1) dissolving in an aqueous medium
  (a) a melamine-formaldehyde having free methylol groups and selected from a melamine-formaldehyde resin, a urea-formaldehyde resin and mixtures thereof, and
  (b) a water-soluble salt of a volatile base and a copolymer of vinyl acetate and an α,β-ethylenically unsaturated compound containing a carboxylic acid group, having a/b varying in parts by weight from 5/95 to 60/40,
(2) dispersing photoconductive particles in said medium,
(3) coating said medium on a conductive support, and
(4) curing the coated photoconductive layer on drying.

The photoconductive substance is preferably photoconductive zinc oxide and the mixture of binding agents preferably consists of (a) melamine-formaldehyde resin and (b) a salt of ammonia and a copoly(vinylacetate/crotonic acid) which contains at least 90 mol percent of vinyl acetate groups in a ratio of a/b varying in parts by weight from 5/95 to 60/40.

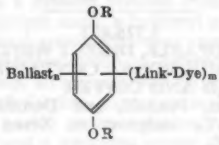
3,725,062

COLOR DIFFUSION PROCESSES UTILIZING HYDROQUINONES WHICH PROVIDE DYE IMAGE MATERIALS UPON OXIDATION IN ALKALINE CONDITIONS

Albert E. Anderson, Penfield, and Kin Kwong Lum, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 6, 1971, Ser. No. 160,062
Int. Cl. G03c 5/54, 1/40, 7/00
U.S. Cl. 96—3 11 Claims

Color diffusion transfer processes are described which employ dye image-providing materials which are alkali-cleavable upon oxidation to release a dye or dye precursor which diffuses to a dye image-receiving layer. The compounds have the formula:



wherein Link is S or O, R is H or a hydrolyzable entity, n is 1 to 3 and m is 1 to 3.

3,725,063

DEVELOPER SCAVENGERS FOR IMAGE TRANSFER SYSTEMS

Eugene F. Wolfarth, Pittsford; Donald A. Smith, Rochester; Charles F. Farran, Pittsford, and Glen M. Dappen, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 13, 1971, Ser. No. 106,281
Int. Cl. G03c 5/54
U.S. Cl. 96—29 D 16 Claims

A developer scavenger layer comprising an isocyanate-bisulfite addition product and a polymeric binder is useful for reducing background stain in a dye image-receiving element of a color diffusion transfer system utilizing immobile couplers which form diffusible dyes.

3,725,064

PHOTOSENSITIVE PROPARGYL POLYMER COMPOSITION AND METHOD OF USING

Nathan D. Field, Allentown, and Harlan B. Freyermuth, Easton, both of Pa., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 35,551, May 7, 1970, Pat. No. 3,657,197. This application Nov. 8, 1971, Ser. No. 196,777
Int. Cl. G03c 1/68, 1/70
U.S. Cl. 96—35.1 8 Claims

A light-sensitive solvent soluble film-forming polymer containing a propargyl group is disclosed. The propargyl group-containing polymers can be used as a photoresist with or without a sensitizer. In another aspect of the disclosure, a sensitizer-stabilizer comprising a xanthen-9-one or a thioxanthen-9-one is disclosed.

3,725,065

METHOD FOR MAKING A KINESCOPE COMPRISING A COLOR SELECTION MASK WITH TEMPORARY CORRIDORS

Glenn Roland Fadner, Jr., Landisville, Pa., assignor to RCA Corporation

Filed Sept. 30, 1970, Ser. No. 76,907
Int. Cl. G03c 5/00
U.S. Cl. 96—36.1 9 Claims

Method for producing a color kinescope by steps comprising the provision of a perforated etch-resistant layer on a substrate and providing apertures in the substrate, which apertures are in substantial register with and individually larger than the openings of the perforated layer; providing a heat-resistant layer on the exposed surface of the perforated etch-resistant layer to produce a workpiece; heating the workpiece to an elevated temperature (e.g., to the annealing temperature) and shaping the substrate-heat resistant layer assembly to produce a temporary mask; producing an image screen with the temporary mask; removing the heat-resistant layer and any remains of the etch-resistant layer from the apertured substrate to produce a color-selection mask; and incorporating the color-selection mask and the image screen in a kinescope.

3,725,066

DIAZO-TYPE MULTICOLOR REPRODUCTION PROCESS

Kouzi Nihyakumen, Toshihiro Kouchi, and Taizo Yokoyama, Osaka, Yasuo Ueda, Kobe, and Yasutoki Kamezawa and Tatsuo Aizawa, Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,518
Claims priority, application Japan, Sept. 1, 1969, 44/68,938
Int. Cl. G03c 5/34, 1/58
U.S. Cl. 96—49 8 Claims

A coloring material in use for the diazo-type multicolor reproduction which comprises a thermovolatile or thermosublimative acid addition salt of a thermovolatile or themosublimative azo coupling component having an amino group, and a diazo-type multicolor reproduction process using such coloring material.

3,725,067

SILVER HALIDE EMULSION CONTAINING 1-H-PYRAZOLO[3,2-c]-s-TRIAZOLE COLOR COUPLERS

Joseph Bailey, Harrow Middlesex, and Edward B. Knott, Bushey Heath, England, and Peter A. Marr, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 778,329, Nov. 22, 1968. This application Jan. 15, 1971, Ser. No. 106,892
Claims priority, application Great Britain, Jan. 15, 1970, 1,957/70
Int. Cl. G03c 7/00, 7/40
U.S. Cl. 96—56.5 7 Claims

1-H-pyrazolo[3,2-c]-s-triazoles having utility as photographic color couplers possessing good coupling activity and forming dyes of good spectral absorption characteristics and also utility as precursors in the formation of various methine sensitizing dyes.

3,725,068

PROCESS FOR THE PHOTOGRAPHIC DEVELOPMENT OF SILVER SALTS

Max Meier, Fribourg, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Apr. 15, 1971, Ser. No. 134,483
Claims priority, application Switzerland, Apr. 17, 1970, 5,796/70
Int. Cl. G03c 5/30
U.S. Cl. 96—66 HD 7 Claims

The present process for the photographic development of silver salts is carried out with 1,4-diazine compounds reduced at most to the dihydro stage. The latter are produced from the 1,4-diazines by reduction in situ in an acid medium.

3,725,069

DIAZO LITHOGRAPHIC COMPOSITION AND ARTICLE

Oswyn K. Hammond, Westbrook, Maine, assignor to Scott Paper Company, Delaware County, Pa.

No Drawing. Filed Sept. 13, 1971, Ser. No. 180,067
Int. Cl. G03c 1/54; G03f 7/08
U.S. Cl. 96—75 4 Claims

Photosensitive compositions comprising a copolymer of styrene and allyl alcohol and a lithographic diazo compound.

3,725,070

PHOTOGRAPHIC ELEMENT COMPRISING FILM FORMING POLYMERIC SUPPORT

Frederick L. Hamb and John C. Wilson, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 7, 1971, Ser. No. 141,445

Int. Cl. G03c *1/78*

U.S. Cl. 96—87 R **5 Claims**

Novel high molecular weight polymers of 1,1'-spirobi [indan] diols or diamines, dicarboxylic acids of four or more carbon atoms and other diols which are useful in the preparation of photographic film bases.

3,725,071

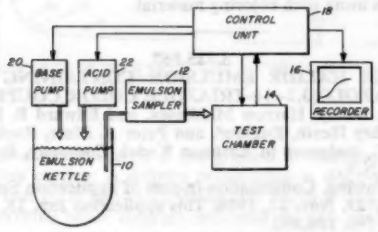
METHOD AND APPARATUS FOR CONTROLLING CHARACTERISTICS OF FOGGED SILVER HALIDE EMULSIONS

David C. Seelbinder and Clinton S. Ballard, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of abandoned application Ser. No. 771,925, Oct. 30, 1968. This application Mar. 29, 1971, Ser. No. 129,259

Int. Cl. G03c *1/02*

U.S. Cl. 96—94 **8 Claims**



Method and apparatus for maintaining optimum fog levels in fogged silver halide emulsions by controlling the development rate characteristics thereof. A developing agent is added to a sample of the liquid emulsion prior to its coating on a substrate, and the density of the developing sample is measured at first and second time intervals following the addition of the developer. The ratio of the two density measurements is then compared with a predetermined value representing optimum development rate characteristics, and the pH of the emulsion is altered in the event the measured density ratio differs from the predetermined value, the pH being increased in the event the density ratio is less than the predetermined value, and decreased if the density ratio is greater than the predetermined value. The pH of the emulsion is held at this higher or lower value for such time as is required to bring the density ratio of the emulsion to approximately the predetermined value representative of optimum fog level just prior to coating.

3,725,072

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS CONTAINING A NOVEL YELLOW-FORMING COUPLER

Makoto Yoshida, Momotoshi Tsuda, Yasushi Oishi, and Kiyoshi Nakazyo, Ashigara-machi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

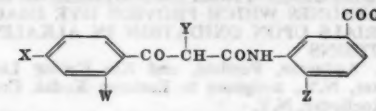
Filed Oct. 19, 1970, Ser. No. 81,939

Claims priority, application Japan, Oct. 17, 1969, 44/83,029

Int. Cl. G03c *7/60*

U.S. Cl. 96—55 **44 Claims**

A light-sensitive material for producing a colored image comprising a support and a silver-halide emulsion layer containing a yellow-forming coupler having the formula:



wherein R represents an aliphatic radical containing from 8 to 20 carbon atoms, W and X each represents a member selected from the group consisting of a hydrogen atom and a lower alkoxy group, wherein at least one of W and X represents an alkoxy group, Y represents a member selected from the group consisting of a hydrogen atom and a halogen atom, and Z represents a halogen atom, and process for preparing same is disclosed.

3,725,073

LIGHT DEVELOPABLE, DIRECT WRITING, SILVER HALIDE EMULSIONS CONTAINING GOLD, IODINE, LEAD AND COPPER

Robert E. Heeks, Penfield, and Donald P. Sullivan, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

No Drawing. Filed May 25, 1967, Ser. No. 641,135

Int. Cl. G03c *1/28*

U.S. Cl. 96—108 **1 Claim**

A photographic emulsion of the silver chlorobromide print-out type, may be sensitized with a soluble iodide salt and a soluble gold salt. Optimum results may be obtained by also including a soluble lead salt, a soluble copper salt and certain spectral sensitizing dyes.

3,725,074

FOGGED, DIRECT POSITIVE SILVER HALIDE EMULSIONS CONTAINING HYDROXYPHTHALEIN DYES AND SULFONATED COMPOUNDS

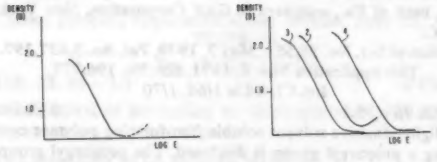
Keisuke Shiba, Masanao Hinata, Koutaro Yamasue, and Tokiharu Kondo, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 19, 1971, Ser. No. 125,992

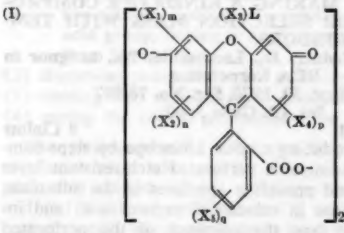
Claims priority, application Japan, Mar. 19, 1970, 45/23,343

Int. Cl. G03c *1/08*

U.S. Cl. 96—122 **14 Claims**



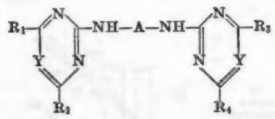
A direct positive silver halide photographic emulsion containing at least one dye represented by the general formula:



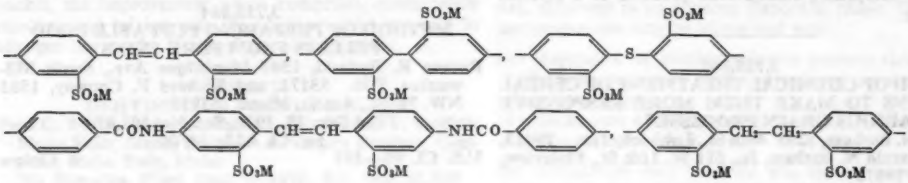
wherein X_1, X_2, X_3, X_4 and X_5 each represents a halogen atom; *m*, *n*, L, and *p* represent 0 or 1; *q* represents 0, 1,

2, 3 or 4; providing that when said *m*, *n*, L, *p* and *q* are 0, said X_1, X_2, X_3, X_4 and X_5 each represents a hydrogen atom; and M represents a member selected from the group consisting of a hydrogen atom, an alkali metal atom, NH_4, and an alkaline earth metal; together with at least one compound represented by the general formula:

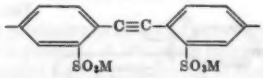
(II)



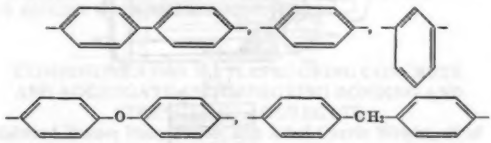
wherein Y represents a member selected from the group consisting of =CH— and =N—; R_1, R_2, R_3, and R_4 each represents a member selected from the group consisting of a hydrogen atom, a hydroxyl group, an alkoxyl group, an aryloxyl group, a halogen atom, a heterocyclic nucleus, an alkylthio group, a heterocyclylthio group, an arylthio group, an amino group, an alkylamino group, a substituted alkylamino group, an arylamino group, a substituted arylamino group, a heterocyclylamino group, an aryl group and a mercapto group; and —A— represents at least one member defined as A_1 and A_2, said A_1 being a member selected from the group consisting of:



and



wherein M represents a member selected from the group consisting of a hydrogen atom and a cation giving water solubility to said compound; and said A_2 being a member selected from the group consisting of:



and

providing that when A is A_2, at least one of said R_1, R_2, R_3 and R_4 is a substitutent containing —SO_3M, wherein M is the same as defined above; and a silver halide photohalide photographic emulsion.

3,725,075

METHOD OF RECOVERING PROTEINS FROM MICROBIAL CELLS

Tadashi Muroi, Yoshitaka Oguri, and Masahiko Ishida, Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1971, Ser. No. 193,490
Claims priority, application Japan, Oct. 28, 1970, 45/94,348
Int. Cl. A23j *1/00, 1/18*
U.S. Cl. 99—14 **14 Claims**

A method of recovering proteins from microbial cells which comprises preparing an extract containing proteins and separating the proteins by isoelectric point precipitation from the extract, said isoelectric point precipitation being performed in the presence of a water soluble salt selected from the group consisting of alkali metal salts and ammonium salts in such an amount that the ionic strength of the salt ranges between 0.002 and 0.2 whereby precipitates of proteins aggregate to grow in size and the precipitates can be separated easily to increase a yield of protein recovery.

3,725,076

COFFEE OF IMPROVED AROMA AND FRESHNESS RETENTION

Arthur Stefanucci, Clifton, N.J., and Douglas R. Harnisch, Riverdale, Joseph E. Coogan III, Tarrytown, and Edward L. Scarsella, Bedford Hills, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,374
Int. Cl. A23f *1/02*
U.S. Cl. 99—68 **3 Claims**

Roasted coffee comprising a blend of non-high grade coffee which has been intermittently quenched prior to completion of the roast and high grade coffee quenched with cold water upon completion of the roast, is subjected to freezing and ground in the frozen state to produce a roasted and ground product characterized by improved aroma retention and freshness after storage under non-refrigerated conditions.

3,725,077

SILVER HALIDE EMULSIONS STABILIZED WITH NITROSO DERIVATIVES OF PHENOLS

Karl Kuffner, Unterhaching, and Ernst Proeschel, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 28, 1971, Ser. No. 138,292
Claims priority, application Germany, Apr. 29, 1970, P 20 20 943.2
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 **4 Claims**

The stabilization of a photographic silver halide emulsion with a compound of the general formula

wherein

X=O, N—OR;
Y=N—OR;
R=H, alkyl group with 1–4 carbon atoms, acyl;
R′=H, halogen, alkyl group with 1–4 carbon atoms.

3,725,078

BORANES AS PHOTOGRAPHIC STABILIZERS

John Howard Bigelow, Rochester, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 30, 1971, Ser. No. 176,308
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 **14 Claims**

Silver halide photographic emulsions containing boranes as stabilizers and antifoggants.

3,725,079

COATING FORMULATIONS CONTAINING PHOSPHATE ESTERS OF GLYCIDOL POLYETHERS

E. Scudder Mackey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 641,482, May 26, 1967. This application Nov. 23, 1970, Ser. No. 92,146

Int. Cl. G03c *1/38*

U.S. Cl. 96—114.5 10 Claims

Coating aids for water-permeable colloid coating compositions comprising phosphate ester products of a glycidol polyether.

3,725,080

COATING FORMULATIONS CONTAINING THE REACTION PRODUCT OF GLYCIDOL POLYETHERS AND SULFATING AGENTS

E. Scudder Mackey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 641,451, May 26, 1967. This application Feb. 1, 1971, Ser. No. 111,747

Int. Cl. G03c *1/38*

U.S. Cl. 96—114.5 10 Claims

Coating aids for water-permeable colloid coating compositions comprising sulfate ester products of a glycidol polyether.

3,725,081

METHOD OF CHEMICAL TREATMENT OF CEREAL GRAINS TO MAKE THEM MORE RESPONSIVE TO VARIOUS GRAIN PROCESSES

Harold N. Barham, 3205 46th St., Lubbock, Tex. 79413, and Harold N. Barham, Jr., 511 W. 11th St., Plainview, Tex. 79072

No Drawing. Filed July 26, 1968, Ser. No. 754,138

Int. Cl. A23k *1/00*

U.S. Cl. 99—2 R 11 Claims

A method for treating cereal grains to locate small molecules in depth, to promote desirable change in available kernel tissues, to make more effective enzymic, oxidative, reductive, hydrolytic, and other chemical changes for the purpose of rendering a major portion of the kernel more useful for various purposes, the method comprising contacting the grain with a gas under vacuum, such as sulfur dioxide or other gas, in the absence of substantial dehydration, to adsorb the gas ubiquitously by the internal structure of the grain, the gas being subjected to the grain at a rate greater than the rate of adsorption.

3,725,082

CENTRIFUGAL COFFEE ROASTING

Joseph Giacone, New Hyde Park, and Marvin Schulman, Monroe, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed May 6, 1971, Ser. No. 140,944

Int. Cl. A23f *1/02*

U.S. Cl. 99—68 4 Claims

Blends of coffee are roasted at elevated temperatures in a centrifugating vessel rotating at speeds sufficient to remove coffee oils, which are characterized by improved purity and clarity.

3,725,083

PROCESS FOR THE PRODUCTION OF NATURALLY OCCURRING COLORING MATERIAL FROM CITRUS FRUIT AND THE PRODUCT THEREOF

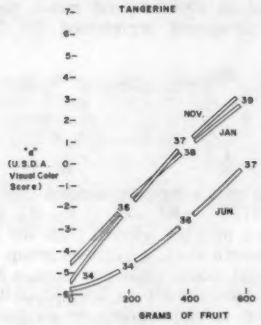
Rodger W. Barron, Lake Alfred, Paul J. Fellers, Winter Haven, and Richard L. Huggart, Lake Wales, Fla., assignors to State of Florida, Department of Citrus

Filed Aug. 5, 1970, Ser. No. 61,385

Int. Cl. A23l *1/26*

U.S. Cl. 99—105 7 Claims

Naturally occurring coloring material is produced from citrus fruit by extracting the juice from the fruit, filtering the juice, centrifuging the filtered juice and separating as solid matter the coloring material which can be added



to juices and other beverages to enhance the natural color thereof.

3,725,084

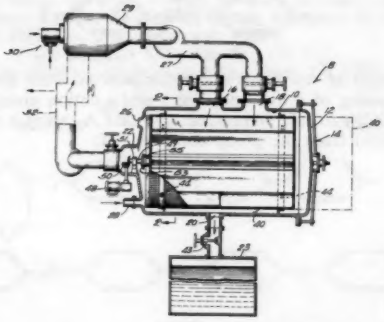
METHOD OF PREPARING PUFFABLE FOOD PELLETS FROM PORK SKINS

Roman R. Rydeski, 1505 Manistique Ave., South Milwaukee, Wis. 53172, and Richard F. Conway, 1503 NW. 7th St., Austin, Minn. 55912

Filed Dec. 28, 1970, Ser. No. 101,874

Int. Cl. A22c *18/00*

U.S. Cl. 99—107 6 Claims



Disclosed herein is a method and apparatus for preparing puffable food pellets from food materials such as green pork skins. Discrete units of the raw food material are subjected to steam at temperatures and pressures sufficient to uniformly introduce and distribute water molecules throughout the food. This step is followed by the steps of rinsing the food portions to remove the melted fat and drying the portions with heated air to encase the added moisture and form crisp pellets which can be substantially expanded in volume or puffed by rapid high temperature cooking.

3,725,085

FLAVOR ENHANCEMENT OF ALLIUM PRODUCTS

Sigmund Schwimmer, Berkeley, Calif., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed July 9, 1971, Ser. No. 161,311

Int. Cl. A23l *1/26*

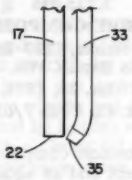
U.S. Cl. 99—140 R 14 Claims

The flavor of onion, garlic, and the like is enhanced by the addition of gamma-glutamyl transpeptidase.

3,725,086
METHOD OF PACKAGING CONSUMABLE LIQUIDS

Robert D. Horner, Upland, Calif., assignor to Tahitian Products Co., Inc.

Filed Sept. 24, 1970, Ser. No. 74,960
Int. Cl. B65b *31/00, 1/04*
U.S. Cl. 99 –189 4 Claims



In a method of packing consumable liquid food matter within sealable, pliable packets wherein the liquid is injected into a preformed packet prior to sealing the packet, the improvement which comprises, concurrently injecting and mixing with the liquid an inert gas such as nitrogen during the filling of the pliable packet.

3,725,087
DEHYDRATED POTATO PIECES

Paul G. Miller, Hsinchu, Taiwan, and Francis C. Griffith, Idaho Falls, Idaho, assignors to Rogers Brothers Company, Idaho Falls, Idaho

No Drawing. Filed Aug. 7, 1970, Ser. No. 62,200
Int. Cl. A23l *1/12*
U.S. Cl. 99—207 14 Claims

Process for producing dehydrated potato pieces for making hash brown potatoes. A low mash temperature of 160–179° F. is coupled with a final drying at a temperature of 90–210° F. and a high humidity of at least 20% for at least 25% of the total final drying time to a moisture content not greater than 8% and at a relative humidity of at least 10% for the remainder of the drying period. A multiple stage final drying is optional.

3,725,088
COMPOSITION FOR WATERPROOFING CONCRETE AND AGGREGATE AND IMPROVING BONDING AND STRENGTH OF AGGREGATE

Edward Penno; Mary Penno, and Athol Currie Wright, all of P.O. Box 278, Nakusp, British Columbia, Canada

Filed June 29, 1971, Ser. No. 158,057
Int. Cl. C09k *3/00*
U.S. Cl. 102—12 2 Claims

This invention relates to the composition for waterproofing concrete and aggregate and for improving the bonding and strength of aggregate. The composition is largely composed of an aqueous solution of calcium chloride, $CaCl_2$, and water in the approximate proportions of 1:4, admixed with an aluminum sulphate, $Al_2(SO_4)_3 \cdot 18H_2O$ water solution, a copper II sulphate $CuSO_4 \cdot 5H_2O$ and water solution, and a caustic potash KOH, and water solution admixed with the aforesaid calcium chloride solution in the order mentioned. The total proportion is approximately calcium chloride, $CaCl_2$, 20 percent, aluminum sulphate, $Al_2(SO_4)_3 \cdot 18H_2O$, 1.2 percent copper II sulphate, $CuSO_4 \cdot 5H_2O$, 0.6 percent, caustic potash KOH, 1.0 percent and the remainder about 78 percent water. The commercial flake calcium chloride contains from approximately 77 percent to approximately 80 percent calcium chloride, the balance being largely water of crystallization. This calcium chloride also contains approximately 0.5 percent sodium chromate Na_2CrO_4. The flake calcium chloride also contains about 0.1 percent calcium hydroxide $Ca(OH)_2$ (which gives slight alkalinity to the chromate treated calcium chloride solution). The flake calcium chloride also contains a maximum of 2 percent sodium chloride NaCl and much less than 0.5 percent magnesium chloride $MgCl_2$.

3,725,089
SMALL PARTICLE DISPERSION COATING COMPOSITION

John C. Zola, 2662 10th Ave., Arcadia, Calif. 91006

No Drawing. Continuation of abandoned application Ser. No. 836,227, June 23, 1969, which is a continuation-in-part of application Ser. No. 609,769, Jan. 17, 1967, now Patent No. 3,458,329, dated July 29, 1969, and application Ser. No. 609,789, Jan. 17, 1967, being a continuation-in-part of application Ser. No. 104,211, Apr. 20, 1961, now abandoned. This application Jan. 19, 1971, Ser. No. 107,865
Int. Cl. B01f *3/08;* C09d *5/18*
U.S. Cl. 106—15 FP 11 Claims

A substantially odor-free coating composition that produces thicker coatings of greater power of concealment in one-coat applications than heretofore has been possible, without the coatings so applied sagging on vertical surfaces or wrinkling on horizontal surfaces. The coating composition of the present invention includes a plurality of colored particles of an aqueous film former, the major portion of which particles are less than 25 microns in size, dispersed in an aqueous dispersing phase. This coating composition may be intermixed with:

(1) dispersions of another color to produce richer color effects than possible with conventional prior art coating compositions,

(2) dispersions of larger particle sizes to produce visible multicolor effects, and

the composition may be dried and applied to a desired surface in that form, or the dried composition may be reconstituted by the addition of water thereto.

3,725,090
METHOD OF PREPARING A LIQUID MIXTURE FOR THE PRODUCTION OF FOUNDRY CORES AND MOULDS

Abram Moiseevich Lyass, Sharikopodshipnikovskaya ulitsa 2, kv. 146; Lidia Dorofeevna Snulova, Sharikopodshipnikovskaya ulitsa 2, kv. 125; Pavel Afanasievich Borsuk, Nizhne-Pervomaiskaya ulitsa 59, kv. 125; Anna Ivanovna Tsyruleva, Serpovpereulok 3/5, kv. 8; and Sergei Dmitrievich Teplyakov, Seleznevskaya ulitsa 13, kv. 3, all of Moscow, U.S.S.R.

No Drawing. Filed July 27, 1971, Ser. No. 166,646
Int. Cl. B28b *7/34*
U.S. Cl. 106—38.35 9 Claims

A method of producing foundry molds and cores comprising the steps of preparing a mixture consisting of foundry sand, pulverulent calcium sulfate hemihydrate (α-modification), a component selected from the group consisting of alkali metal, alkaline earth metal and ammonium lignosulfonates, mixtures thereof and thermopolymers thereof, a foaming agent and water. Molds and cores are formed from said mixture and allowed to harden in air.

3,725,091
GLASS-CERAMIC METAL CERMETS AND METHOD

Chi-Kwus Chyung, Elmira, and Hermann L. Rittler, Horsehead, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed April 12, 1971, Ser. No. 133,289
Int. Cl. B22f *1/00*
U.S. Cl. 106—39 DV 12 Claims

A glass-ceramic metal cermet comprising a glass-ceramic phase consisting essentially of crystals of β-quartz, cordierite, mullite, or calcium aluminate uniformly distributed throughout a glassy matrix and a metal phase consisting essentially of a metal selected from the group consisting of W, Mo, W-Mo alloys and W-Mo-Cr alloys.

3,725,092

ASTERIATED SYNTHETIC CORUNDUM GEM STONES

George A. Keig, El Cajon, Calif., James C. Smith, Indianapolis, Ind., and John M. J. Watts, Poway, Calif., assignors to Union Carbide Corporation, New York, N.Y.

Original application Dec. 31, 1968, Ser. No. 788,255. Divided and this application Jan. 10, 1972, Ser. No. 216,620

Int. Cl. C04b *35/10;* A44c *17/00*

U.S. Cl. 106—42 3 Claims

Asteriated synthetic corundum gem stones are provided which have their asteriating compounds as well as coloring compounds uniformly distributed throughout the body which are free of the heavy banding characterizing previously made synthetic asteriated corundum gem stones. Method and apparatus for the production of these gem stones is also provided.

3,725,093

HIGH LEAD CONTENT GLASS COMPOSITION FOR TELEVISION NECK TUBES

Richard D. Sanner, Sylvania, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Filed June 19, 1970, Ser. No. 47,870

Int. Cl. C03c *3/10, 3/04, 3/30*

U.S. Cl. 106—53 8 Claims

Lead glass compositions which can be used for the manufacture of the neck portion of the television tube which exhibit high X-ray absorption characteristics. These lead glasses have desirable high and low temperature viscosity properties, as a result of which they can be readily drawn and worked and are compatible with existing glass compositions used for making other components of the television picture tube.

3,725,094

DOPED ALUMINA POWDER

Newton Levy, Jr., Ellicott City, Md., David Griffith Wirth, Jr., Golden, Colo., and Richard Raymond Rettew, Laurel, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 6,563, Jan. 28, 1970. This application Sept. 20, 1971, Ser. No. 182,230

Int. Cl. C04b *35/10*

U.S. Cl. 106—62 2 Claims

A process for preparing aluminas containing about 10 parts per million to about 5% of a second inorganic component by mixing a solution or melt of a decomposable salt of aluminum with a salt of the desired inorganic additive and decomposing the resultant mixture in a fluid energy mill. If desired, the resultant powder can be calcined to an alpha-alumina having a crystallite size of less than 2000 angstroms with each ultimate crystallite containing the correct amount of the second component in solid solution or homogeneously dispersed within the alumina.

3,725,095

FOAMED ALKALI SILICATE BINDER COMPOSITIONS

Verne Wesley Weidman and Paul C. Yates, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 779,275, Nov. 26, 1968. This application Apr. 1, 1971, Ser. No. 130,469

Int. Cl. C04b *35/16*

U.S. Cl. 106—75 19 Claims

This invention relates to stable shapeable aqueous siliceous foams prepared from an alkaline ionic silicate, e.g., sodium silicate, a cationic surface active nitrogen-contajning "onium" compound and optionally colloidal amorphous silica sols. The foam can contain a filler material such as perlite and can also contain a latent gelling agent such as formamide which hydrolyzes to aid in setting the foam. The foam can also be contacted with an acidic acting gas, e.g., carbon dioxide which aids in the foam setting mechanism.

3,725,096

ADHESIVE COMPOSITION

Joseph G. Stanke, 1220 2nd St. N., Wisconsin Rapids, Wis. 54494

No Drawing. Filed Mar. 29, 1971, Ser. No. 129,260

Int. Cl. C04b *7/02*

U.S. Cl. 106—90 13 Claims

An adhesive composition comprising the combination of crude tall oil, cement and an aqueous solution of ammonium hydroxide. The cement is used in the ratio of 1 to 3 parts per part of tall oil and the ammonium hydroxide solution is used in the ratio of 1 part to 6 to 10 parts by weight of the cement. The composition cures or sets to provide an infusible product which can be used as an adhesive, a surface coating or a binder for reinforcing materials.

3,725,097

CEMENT COMPOSITIONS AND THE PREPARATION THEREOF

Richard B. Peppler and Philip A. Rosskopf, South Euclid, Ohio, assignors to Martin Marietta Corporation, New York, N.Y.

No Drawing. Filed June 10, 1971, Ser. No. 151,896

Int. Cl. C04b *7/02*

U.S. Cl. 106—90 36 Claims

The water content of hydraulic cement mixes for a given plasticity is reduced, and the strength of the hardened concrete produced therefrom is increased by the incorporation of inositol in said mixes. Early strength is increased, and the retardation of the rate of set is less than that normally encountered in obtaining the desired advantages in the properties of the mixes. The inositol is employed in an amount within the range of from about 0.005% to about 0.75% by weight, preferably from about 0.10% to about 0.25% by weight of cement. Set accelerators can also be incorporated in the cement mix, the properties of the accelerators and said inositol being additive so that an increase in the compressive strength of the hardened mix is achieved while, at the same time, increasing the rate of set of the mix including said inositol and accelerators.

3,725,098

HEAT-SEALABLE COATINGS OF IMPROVED WETTABILITY AND METHODS OF PRODUCING THE SAME

Pierre Hullot, 12 Rue de Celestins, 78 Limay, France

No Drawing. Continuation-in-part of application Ser. No. 808,297, Mar. 18, 1969. This application Oct. 18, 1971, Ser. No. 189,831

Claims priority, application France, June 21, 1968, 155,993

Int. Cl. C08h *27/60*

U.S. Cl. 106—180 4 Claims

A heat-sealable coating of improved wettability by water and improved adhesion through aqueous glues comprising a conventional heat-sealable coating, e.g., a nitrocellulose varnish having incorporated therein one or more waxes, having an average hydroxyl number between 150 and 400, preferably between 200 and 300. The waxes are preferably incorporated into the coating in an amount of between 0.5% and 5% by weight, the improved heat-sealable coat-

ing preferably being applied to a regenerated cellulose film.

3,725,099

WHITE SILICON CARBIDE SOSOLOIDS

Arthur Jack Nozik, Westport, and Samuel Tribit, Hawthorne, N.Y., and Ferd E. Williams, Newark, Del., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Dec. 23, 1970, Ser. No. 101,197
Int. Cl. C08h *17/02*; C04b *35/14*
U.S. Cl. 106—288 B 4 Claims

Pigmentary silicon carbide sosoloids of exceptional whiteness are achieved by a solid solution of silicon carbide and from 0.10 to 25% by weight of a compound having an optical band gap in excess of five electron volts, e.g., aluminum nitride and boron phosphide. The sosoloids are prepared by heating a source of silicon intimately admixed with a Group III element with a source of carbon at a temperature above 1350° C. in the presence of hydrogen and a Group V element.

3,725,100

METHOD FOR PROCESSING KAOLIN CLAY COATING PIGMENT AND IMPROVED PRODUCT THEREOF

William E. Zentz, Jr., Iselin, N.J., assignor to Engelhard Minerals and Chemicals Corporation, Woodbridge, N.J.

No Drawing. Continuation-in-part of applications Ser. No. 813,277, Apr. 3, 1969, and Ser. No. 887,384, Dec. 22, 1969. This application Feb. 17, 1971, Ser. No. 116,219
Int. Cl. C08h *17/06*; C08k *1/12*
U.S. Cl. 106—288 B 19 Claims

A small amount of boric acid or an acid-soluble borate salt is added to acidic, bleached kaolin clay in the presence of zinc ion before deflocculating an aqueous suspension of the clay with a sodium condensed phosphate salt.

3,725,101

MONOAZO PIGMENT MIXTURES AND PROCESS FOR THEIR PREPARATION

Rudolf Kuhne, Frankfurt am Main, Heinrich Hamal, Schwalbach, Taunus, and Thilo Thilenius, Sulzbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 12, 1971, Ser. No. 123,818
Claims priority, application Germany, Mar. 14, 1970, P 20 12 153.3
Int. Cl. C08h *17/14*
U.S. Cl. 106—288 Q 7 Claims

Mixtures of monoazo dyestuffs obtained by coupling diazotized aniline, which may be substituted by lower alkyl, lower alkoxy, halogen or nitro with a mixture of one or two polar coupling components of the acetoacetylamino benzene, 1-arylpyrazolone-(5) or naphthol series containing 1 or 2 carboxylic acid, sulfonic acid, carboxamido or sulfonamido groups and another mixture consisting of one or two unpolar coupling components of the acetoacetylaminobenzene, 1-arylpyrazolone-(5) or naphthol- series without any solubilizing group. The dyestuff mixtures show improved rheological properties and an improved tinctorial strength. Moreover, they yield purer shades and have an increased transparency.

3,725,102

INORGANIC PIGMENTS

Floyd A. Hummel, State College, Pa., and James F. Sarver, Jr., Lyndhurst, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of application Ser. No. 664,337, Aug. 30, 1967, which is a continuation-in-part of application Ser. No. 344,363, Feb. 12, 1964. This application July 18, 1969, Ser. No. 843,164
Int. Cl. C09c *1/00*
U.S. Cl. 106—288 B 18 Claims

A bluish-pink pigmented work product deriving its bluish-pink color from a calcined pigment composed of about 10 to 55 parts by weight of CoO, about 1 to 35 parts by weight Li_2O and about 40 to 72 parts by weight P_2O_5.

3,725,103

CARBON BLACK PIGMENTS

Merrill E. Jordan, Walpole, William G. Burbine, Whitman, and Frank R. Williams, Quincy, Mass., assignors to Cabot Corporation, Boston, Mass.

No Drawing. Filed Mar. 10, 1971, Ser. No. 123,081
Int. Cl. C08h *17/08*
U.S. Cl. 106—307 10 Claims

A family of new and novel carbon black products having unusually high tint which are suitable for use in the preparation of reinforced rubber systems.

3,725,104

METHOD OF PROVIDING AND DEVELOPING HIDDEN ENTRIES

Robert D. Fraik, Lincoln Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 822,287, May 6, 1969. This application Mar. 26, 1970, Ser. No. 23,036
Int. Cl. B41m *5/12, 5/18*
U.S. Cl. 117—1.7 5 Claims

The discolored paper-based feedback systems employ thermographic processes which transfer a pattern of vaporized reactant material selected from the group consisting of: dithiooxamide, the N,N^1-disubstituted derivatives of dithiooxamide, and an iron-complexing compound having a benzene ring and at least two hydroxyl groups substituted in adjacent positions on said ring to a treated or untreated paper-like receptor sheet to form a storable latent image, i.e. a hidden entry, on the sheet. The latent image can be developed weeks or months later with a co-reactant metal salt.

3,725,105

ADHERENT RESIN WITH RELEASE SURFACE

Raymond Burt Chase, 2549 Midland Road, Midland, Mich.

Continuation-in-part of Ser. No. 842,405, July 16, 1969, abandoned, which is a continuation-in-part of Ser. No. 535,324, March 18, 1966, abandoned. This application March 19, 1971, Ser. No. 126,284
Int. Cl. C03c *17/00*; B32b *15/08*
U.S. Cl. 117—2 R 8 Claims

Cured epoxy resin containing finely powdered silicone resin as filler adheres to a surface but does not conduce to formation of adherent deposits upon its own surface; the silicone is a poly-approximately-mono-substituted siloxane. The product is useful as a repair or lining or coating material for vessels upon the walls of which accumulation of deposits of adherent material is contraindicated.

3,725,106

METHOD AND APPARATUS OF MAKING COLOR CATHODE RAY TUBE

Kakuichiro Hosokoshi, Neyagawa, Japan, assignor to Matsushita Electronics Corporation

Filed Oct. 30, 1970, Ser. No. 85,337
Int. Cl. B44d *1/02*; C03c *17/00*; H01j *1/54*
Claims priority, application Japan, Oct. 30, 1969, 44/87363
U.S. Cl. 117—33.5 CM 2 Claims

In order to avoid undesirable loss of color disparity in the performance of a cathode ray tube of the multi-beam, multicolor, shadow mask type, it is preferable to limit the diameter of each color dot on the phosphor screen. In the process of fixing phosphor dots on a phosphor screen inside a face plate of

the cathode ray tube during the fabrication thereof, a specially shaped light-emitting source is employed, in order to limit the diameter of each phosphor dot to no larger than that of each aperture in the shadow mask through which ultraviolet rays

strike the screen to fix said dot. The light-emitting source has a small light-emitting point on the top of the transparent light conduit, which conduit is provided eccentrically on a shaft so that it rotates around in a small circle in a plane parallel with the face plate.

3,725,107

COPYING SHEET

Fritz Opderbeck, Buederich near Dusseldorf; Theodor Ploetz, Hoesel, Kries Nettmann, and Herbert Wistuba, Viersen, all of Germany, assignors to Feldmuhle Anlagen-Und Produktionsgesellschaft mit beschrankter Haftung, Duesseldorf-Oberkassel, Germany

Continuation of Ser. No. 809,949, March 24, 1969, abandoned. This application June 14, 1971, Ser. No. 153,025

Claims priority, application Germany, March 23, 1968, P 17 71 031.5

Int. Cl. B41m *5/16, 5/18*

U.S. Cl. 117—36.7 **5 Claims**

The invention relates to a copying sheet consisting of a base material or substrate having pressure or heat sensitive, opaque coatings of synthetic dispersions and softeners, preferably in combination with at least one stearate, wherein either the base material or the coating contains dyes or colored pigments that, on application of heat and/or pressure, make the characters impressed on the sheet readable.

3,725,108

CHEMICAL REDUCTION METAL PLATED DIALLYLPHTHALATE POLYMER AND PREPARATION PROCESS

Edward B. Saubestre, Hamden, Conn., and Lawrence J. Durney, North Caldwell, N.J., assignors to Enthone, Incorporated, West Haven, Conn.

Division of Ser. No. 804,713, March 5, 1969, Pat. No. 3,595,761, which is a continuation-in-part of Ser. No. 433,775, Feb. 18, 1965, abandoned. This application Feb. 16, 1971, Ser. No. 115,759

Int. Cl. B44d *1/094*; **C23c** *17/02*

U.S. Cl. 117—47 A **9 Claims**

This invention is concerned with chemical reduction metal-plated diallylphthalate polymers wherein a thin, substantially non-porous, continuous metal layer of fine grain size and consisting essentially of chemical reduction metal is firmly adhered to the polymer surface by a bond strength equivalent to a Pull Test result of at least 5 pounds per inch. One or more metal electroplate layers may be deposited over the chemical reduction metal layer. The invention is also concerned with the preparation of metal-plated diallylphthalate polymers involving the contacting of the polymer surface destined to be metal plated with an alkaline aqueous solution containing about 5 to 45 weight percent of methyl Carbitol and about 5 to 30 weight percent of sodium hydroxide or potassium hydroxide until the polymer surface is converted to a gelled and hydrophilic polymer surface, followed by contacting the gelled hydrophilic surface with a chromic acid- and/or surfuric acid- containing aqueous acid etchant solution until the polymer surface is converted to a surface readily bondable to electroless metal plating by a firmly adherent bond. The thus-treated polymer surface is then activated and electrolessly metal plated by contact with a chemical reduction metal plating solution until the polymer surface is converted to an electrically conductive surface. The thus-obtained conductive surface can then be electroplated, if desired, with one or more metal electroplate layers.

3,725,109

METHOD OF PREPARING SULFONATED STYRENE POLYMER PHOTOGRAPHIC FILMS

Gerald L. Schulz, Midland, and Robert J. Caiola, Saginaw, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation of abandoned application Ser. No. 839,069, July 3, 1969. This application Oct. 21, 1971, Ser. No. 191,350

Int. Cl. G03c *1/78*

U.S. Cl. 117—47 A **6 Claims**

Photographic films are made from styrene polymers as the film base without the necessity of using subbing coats between the film base and the photosensitive layer by sulfonating the styrene polymer film base so that it contains a high concentration of sulfonic acid groups. Good adhesion between the layer and the base is obtained.

3,725,110

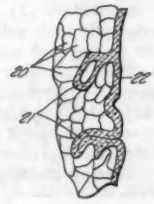
PROCESS OF COATING ARTICLES WITH PYROLYTIC GRAPHITE AND COATED ARTICLES MADE IN ACCORDANCE WITH THE PROCESS

John T. Rodgers, Long Beach, Richard M. Williams, Montclair, and Richard J. Larsen, Alhambra, Calif., assignors to Ducommun Incorporated, Vernon, Calif.

Continuation of abandoned application Ser. No. 559,781, June 23, 1966. This application Nov. 13, 1969, Ser. No. 871,761

Int. Cl. C23c *11/00, 11/10*; **C01b** *31/07*

U.S. Cl. 117—46 CG **5 Claims**



A process of producing a pyrolytic graphite coating on a substrate which will not peel off, said coating being deposited in a two (2) step process wherein first there is deposited a coating of pyrolytic graphite or pyrolytic carbon at temperatures of between 900° and 1350° C. and subsequently depositing a second pyrolytic graphite coating at temperatures between 1500° and 1900° C. The pyrolytic graphite or pyrolytic carbon coated product is produced by the above process.

3,725,111
METHOD OF COATING GLASS BEADS WITH A LOW CROSS-LINKED POLYMER

Csaba Horvath, Orange, and Seymour R. Lipsky, Woodbridge, Conn., assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

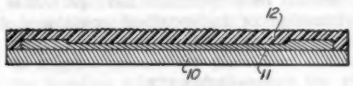
No Drawing. Continuation-in-part of abandoned application Ser. No. 14,182, Feb. 25, 1970. This application Dec. 21, 1970, Ser. No. 100,368
Int. Cl. C03c *17/30, 17/32*
U.S. Cl. 117—54 4 Claims

A support medium consisting of a highly swellable polymer resin coated on a fluid impervious, shaped core material is described. In specific embodiments, glass beads are provided with a coating of a highly swellable low-cross linked polymer such as polystyrene. Reactive groups, such as the chloromethyl group, are introduced into the polymer coating. The aforesaid support medium is useful in the solid phase synthesis of complex molecules such as polypeptides, polynucleotides, polysaccharides, proteins, polyamides and the like.

3,725,112
NOVEL DISPLAY DEVICE

Lindsey B. Hansen, 2367 Porter Ave., Ogden, Utah 84401

Filed Dec. 4, 1970, Ser. No. 95,101
Int. Cl. B32b *33/00;* G09f *7/00*
U.S. Cl. 117—75 10 Claims



A novel display device comprising a substrate, a decorative surface on said substrate and a protective, low-gloss, uniformly textured, transparent, polymeric, organic coating adherent thereon and a process for making same has now been invented. Display devices, especially outdoor displays such as road signs, billboards, and the like are protected and made more readable by application of an adherent, transparent, polymeric organic coating which has a smooth, fine, uniform surface texture to provide a low-gloss finish. The display device is formed by applying to the decorative surface a resinous material which cures to a clear, transparent film having a fine uniformly textured surface. One manner of obtaining a clear, transparent, textured film comprises adding to a polymerizable organic material a component which initiates polymerization, continuing polymerization to attain a resinous mixture having a predetermined ratio of polymerized material to polymerizable material, applying the resinous mixture to a substrate having a decorative surface thereon to form a substantially continuous film of protective coating, and curing the resinous mixture to obtain a uniformly textured, transparent, polymeric, organic coating on said substrate.

3,725,113
BLOOD COMPATIBLE MICROENCAPSULATED DETOXICANTS AND METHOD FOR MAKING

Thomas M. S. Chang, Montreal, Quebec, Canada, assignor to Research Corporation, New York, N.Y.

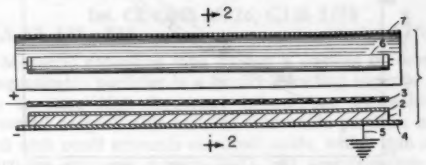
Filed Dec. 17, 1970, Ser. No. 99,269
Int. Cl. A61k *23/02;* G01n *31/06*
U.S. Cl. 117—82 4 Claims

Blood compatible microencapsulated detoxicants suitable for the detoxification of blood in an extracorporeal shunt are made by coating a solid detoxicant with a semipermeable polymer membrane and then coating the membrane with a non-interfering layer of a blood compatible protein.

3,725,114
CURING PHOTOPOLYMERIZABLE FILM-FORMING POLYMER COATINGS

Carl J. Warneke, deceased, by Mabel P. Warneke, administrator, Chicago, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed May 28, 1971, Ser. No. 148,024
Int. Cl. B44d *1/50;* C08f *1/22*
U.S. Cl. 117—93.1 CD 4 Claims



Photopolymerizable film-forming polymer coatings are cured by subjecting them to light waves within the range of 1850 to 4000 angstroms in the presence of an electrostatic field.

3,725,115
PRESSURE-SENSITIVE ADHESIVE ARTICLES AND METHOD OF MAKING SAME

Roger M. Christenson and Carl C. Anderson, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed June 18, 1970, Ser. No. 47,557
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 13 Claims

A pressure-sensitive adhesive having excellent properties is formed by heating a solid radiation-sensitive hot-melt composition of tacky low molecular weight polymers which are capable of forming pressure-sensitive adhesives to a temperature sufficiently above its melting point and applying the hot-melt composition to a backing and subjecting the hot-melt composition to ionizing irradiation. The resulting material is a strong pressure-sensitive adhesive.

3,725,116
METHOD OF COATING WITH ACRYLOXY ESTERS OF ANHYDRIDES

Gordon M. Parker, Lower Burrell, Marco Wismer, Gibsonia, and Ernest A. Hahn, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 840,524, July 9, 1969. This application Nov. 18, 1970, Ser. No. 90,842
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 16 Claims

This invention relates to acryloxy(or methacryloxy) alkyl(or alkyloxyalkyl) acryloxy(or methacryloxy) hydroxyalkyl organic polycarboxlic esters prepared by reacting an organic acid anhydride selected from the group consisting of trimellitic anhydride and pyromellitic anhydride with a hydroxyalkyl acrylate or methacrylate and then reacting this half-ester with a glycidyl acrylate or methacrylate. These compounds are useful in coating compositions and particularly coating compositions curable by radiation.

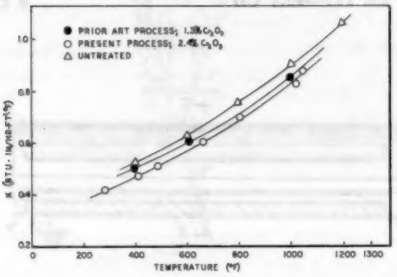
3,725,117
CHROMIUM OXIDE COATING FOR SILICEOUS ARTICLES

Bernard E. Caruso, Upland, Calif., assignor to Hitco, Gardena, Calif.

Filed Sept. 3, 1970, Ser. No. 69,288
Int. Cl. C03c *25/02*
U.S. Cl. 117—100 S 18 Claims

An improved treatment for providing a chromium oxide coating on siliceous articles, particularly, high silica

content fibers, and articles comprised thereof, by applying a solution of a Werner complex of an organic dicarboxylic acid and a dichromate, particularly ammonium



dioxalatodiaquochromate, to the article and heating the article to pyrolitically decompose the complex to form said coating.

3,725,118

COATED CARRIER PARTICLES WITH MAGNITUDE OF TRIBOELECTRIC CHARGE CONTROLLED AND METHOD OF MAKING SAME

Sterritt R. Fuller, Jr., and Howard E. Munzel, Lexington, and Kenneth D. Woosley, Winchester, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed June 23, 1971, Ser. No. 156,060

Int. Cl. G03g *13/08*; B32b *15/08*

U.S. Cl. 117—100 M **5 Claims**

An electrophotographic development carrier comprising core particles coated with a carboxylated polyethylene ionomer. When utilized with appropriate electroscopic toner materials, the carrier, which is coated with a carboxylated polyethylene ionomer is effective in producing a desired polarity and magnitude of the triboelectric charge on the toner ptrticles. Control of the polarity and magnitude of the triboelectric charge characteristic of the carrier, which has its particles coated with the carboxylated polyethylene ionomer is obtained by controlling the curing temperature of the carboxylated polyethylene ionomer.

3,725,119

METHOD FOR DECORATING SURFACES

Charles A. Coffey and Michael J. Catena, Tampa, Fla., assignors to Harris Paint Company, Tampa, Fla.

No Drawing. Continuation-in-part of application Ser. No. 44,590, June 8, 1970. This application Feb. 8, 1971, Ser. No. 113,729

Int. Cl. B44d *1/08*

U.S. Cl. 117—104 R **10 Claims**

A method for giving solid and porous surfaces sparkling brilliance by the application thereto of a vehicle to which solid, highly reflectant, colored or uncolored particles have been added, which comprises: applying to the surface to be coated a spray of a composition comprising solid particles which may be solely solid polyester resin or polyester resin blended with other particles capable of effecting brilliance such as metallic or glass particles, a vehicle for said particles which may contain colorants such as opaque or transparent pigments or dyes, and a means of propelling the composition such as an aerosol propellant or other pressure systems to spray aforementioned composition, thereby providing various mono or multi-colored reflective effects. Silk screening as well as conventional spray is included.

3,725,120

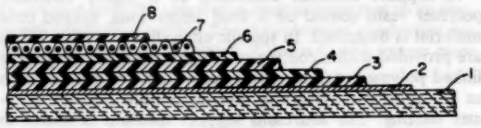
POLYURETHANE CONTAINER

Charles A. Suter, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of application Ser. No. 1,984, Jan. 12, 1970, which is a continuation of application Ser. No. 579,570, Sept. 14, 1966. This application Dec. 13, 1971, Ser. No. 207,639

Int. Cl. B44d *1/02*

U.S. Cl. 117—104 R **9 Claims**



A composite structure and method of preparation comprising essentially a layer of a cured polyurethane adhered to a layer of a hydrocarbon barrier. It is preferred that the barrier layer be applied in a solution with a solvent comprising at least one liquid ketone to a partially cured polyurethane following which the polyurethane is further cured, the said barrier layer comprising a polymer of from about 50 to about 100 mole percent of vinylidene chloride and correspondingly of up to about 50 mole percent of a material selected from the group consisting of vinyl chloride and acrylonitrile. The composite structure and method of preparation have particular utility in the fabrication of hydrocarbon containers such as fuel tanks.

3,725,121

THERMALLY STABLE PRESSURE-SENSITIVE ADHESIVE TAPE WITH POLYPROPYLENE BACKING

Albert Anthony Fournier, Bridgewater, N.J., assignor to Johnson & Johnson

No Drawing. Filed Apr. 9, 1971, Ser. No. 132,879

Int. Cl. C09j *7/02*

U.S. Cl. 117—122 PF **6 Claims**

A heat resistant polypropylene backed acrylate pressure-sensitive adhesive tape wherein the acrylate adhesive is modified by the addition of 5–25 percent of a phenol formaldehyde resin prior to coating on the polypropylene backing.

3,725,122

PRESSURE-SENSITIVE ADHESIVE COATED ARTICLES HAVING A POLYACRYLATE ADHESIVE COATING

Hans Reinhard, Limburgerhof, Alfred Mueller, Biblis, and Bernhard Dotbauer, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Mar. 3, 1970, Ser. No. 16,224

Claims priority, application Germany, Mar. 6, 1969, P 19 11 306.5

Int. Cl. C09j *7/02*

U.S. Cl. 117—122 P **2 Claims**

Pressure-sensitive adhesive coated articles having at least one adhesive coating comprising a copolymer of

(a) from 55 to 90% by weight of acrylic and/or methacrylic esters of primary and/or secondary alkanols having 4 to 12 carbon atoms, of which at least 25% are derived from alkanols having 6 to 12 carbon atoms;

(b) from 10 to 40% by weight of acrylic and/or methacrylic esters of tertiary alkanols having 4 to 12 carbon atoms; and

(c) from 3 to 12% by weight of polymerizable heterocyclic N-vinyl compounds and/or other olefinically unsaturated monomers containing reactive groups.

3,725,123

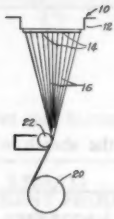
GLASS FIBER REINFORCED ELASTOMERS

Alfred Marzocchi and David E. Leary, Cumberland, R.I., assignors to Owens-Corning Fiberglas Corporation

Filed Dec. 21, 1970, Ser. No. 99,792

Int. Cl. C03c *25/00*

U.S. Cl. 117—126 GE **13 Claims**



This invention is addressed to the improvement in the bonding relationship between glass fibers and elastomeric materials with which the glass fibers are combined in the manufacturer of glass fiber reinforced elastomeric products wherein the bonding relationship between the glass fiber surfaces and the elatomer is improved by coating individual glass fibers, or impregnating bundles of glass fibers, with a resorcinol aldehyde latex system formulated to include a low molecular weight component, preferably in the form of an alkanolyl donor compound which is believed to migrate toward the glass fiber surfaces to enhance the bonding relationship between the glass fibers and the elastomeric material.

3,725,124

POLYMERIC FILM COATED WITH VINYL ACETATE/ETHYLENE COPOLYMER ADHESIVE

Bert S. Gorton, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 1, 1968, Ser. No. 764,333

Int. Cl. B32b *21/08, 27/30*

U.S. Cl. 117—138.8 UA **7 Claims**

A polymeric film, e.g., polyvinyl chloride, is disclosed which has, as a heat sealable coating on a surface thereof, a vinylacetatae/ethylene copolymer containing either iminated carboxylic acid groups or N-methylol amide groups. The film is particularly useful in a decorative film/board laminate prepared by a vacuum forming technique.

3,725,125

FABRICS SIZED WITH COPOLYMERS OF SULFUR DIOXIDE AND ALLYL EPOXYALKANE ETHERS

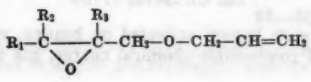
William Ross Moore and Ralph Rolland Langner, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Nov. 4, 1970, Ser. No. 86,940. Divided and this application July 22, 1971, Ser. No. 165,327

Int. Cl. C08j *1/44*

U.S. Cl. 117—139.5 A **3 Claims**

Natural and synthetic fabrics are sized with copolymers of sulfur dioxide and compounds of the formula



wherein R_1, R_2 and R_3 are independently hydrogen or methyl groups.

3,725,126

MAGNETIC RECORDING TAPE

Willis D. Haller, St. Paul, and Raymond M. Colline, Oakdale, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of applications Ser. No. 706,401, Feb. 19, 1968, now Patent No. 3,573,980, and Ser. No. 32,919, Apr. 29, 1970, now abandoned. This application Dec. 28, 1970, Ser. No. 102,029

Int. Cl. C04b *35/26;* G11b *5/78*

U.S. Cl. 117—235 **8 Claims**

Magnetic recording tape having a coating of oriented magnetizable particles in a binder affording superior ability to store high frequency information by virtue of oriented magnetizable acicular iron oxide particles modified with small amounts of cobalt oxide, which iron oxide particles comprise gamma-Fe_2O_3. At approximately two parts by weight per one part of binder and physically aligned, the novel particles provide in the aligned direction a coercivity H_c exceeding 350 oersteds and a B_r exceeding 800 gauss. Higher coercivity may be attained by controlling the heating steps in making the novel particles to provide up to about 25% FeO by weight of the total iron oxide.

3,725,127

METHOD AND SYSTEM FOR CONTROLLING A CRYSTALLIZATION INSTALLATION

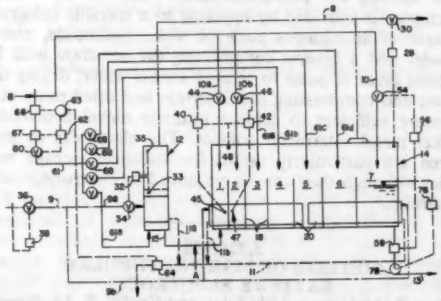
Roger Retali, Saint Cloud, Francis Dambrine, Marcq en Baroeul, Jean Claude Giorgi, Courbevoie, and Georges Windal, Roubaix, France, assignors to Societe Fives Lille-Cail, Paris, France

Filed Mar. 16, 1971, Ser. No. 124,731

Claims priority, application France, Mar. 19, 1970, 9,797

Int. Cl. B01d *1/00, 9/02*

U.S. Cl. 127—16 **15 Claims**



Sugar is crystallized out of sugar juice by passing the juice through a succession of steam-heated crystallization cells. Diluted sugar juice is supplied to the intermediate and last cells. The input of the dilute sugar juice supplied to the last cell is controlled to maintain a constant concentration of the crystallized sugar in the last cell, and the total input of the dilute sugar juice introduced into the intermediate cells is maintained at a control value which is a function of the heating vapor consumed in the cells and the concentration of the dilute sugar juice entering the installation whereby the concentration of the crystallized sugar removed from the last cell is determined.

3,725,128
RECHARGEABLE ELECTROCHEMICAL CELL HAVING COMPLEX METAL FLUORIDE ELECTROLYTE

Seymour Senderoff, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

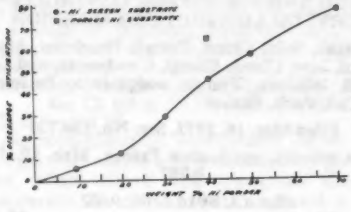
Filed Mar. 12, 1971, Ser. No. 123,570
Int. Cl. H01m *36/00*
U.S. Cl. 136—6 21 Claims

Rechargeable electrochemical cells are disclosed having complex metal fluoride electrolytes comprising an alkali metal fluoberyllate or fluozirconate. In the charged condition, the anode is a metal not greater in activity in the electromotive series than beryllium or zirconium, respectively, and the cathode is the fluoride of a metal less active in the electromotive series than the metal of the anode. A preferred cell has, in the charged condition, a beryllium anode, a nickel fluoride or silver fluoride cathode, and an alkali metal fluoberyllate electrolyte.

3,725,129
METHOD FOR PREPARING PASTED NICKEL HYDROXIDE ELECTRODE

Joseph G. Ruzzo, Jr., Schenectady, N.Y., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Feb. 14, 1972, Ser. No. 226,023
Int. Cl. H01m *43/04*
U.S. Cl. 136—29 6 Claims



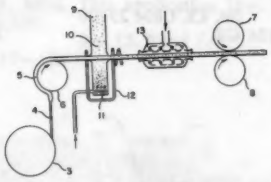
A method for preparing nickel hydroxide ($NiOH_2$) electrodes is provided by applying to a metallic substrate a layer of an aqueous paste of nickel hydroxide, nickel powder and a binder; compressing the substrate with its applied layer of paste to remove excess water; drying the paste; and compressing the substrate and dried paste at a pressure sufficient to achieve intimate nickel hydroxide-nickel metal interfacial contact. The electrodes so prepared are particularly useful for electrical storage batteries although they can be employed in electrolytic cells generally.

3,725,130
METHOD OF MAKING TUBULAR BATTERY ELECTRODE

Johan B. Andersson, Lilla Edet, and Karl E. E. Lindbergh, Nol, Sweden, assignors to Aktiebolaget Tudor, Stockholm, Sweden

Filed Apr. 12, 1971, Ser. No. 132,978
Claims priority, application Sweden, Apr. 16, 1970, 5,182/70
Int. Cl. H01m *3/02*
U.S. Cl. 136—63 4 Claims

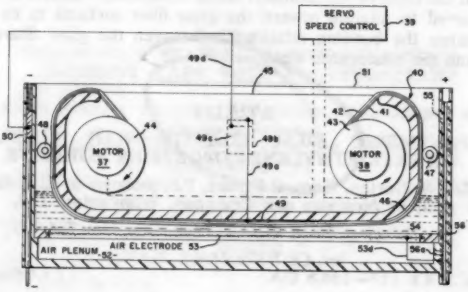
Lead-acid storage battery electrode of the tube plate type having a novel sheath of a glass fiber fabric wherein the yarns are held against slippage by islands of a thermoplastic material. The sheath is made by passing a tube made of glass fiber yarns over a mandrel which extends through a chamber containing pulverized particles of plastic material. The particles are blown on the glass fiber tube while heated and form small islands of plastic material when cooled which impart the necessary mechanical strength to the sheath without substantial reduction in porosity.



3,725,131
RECHARGEABLE MOVING TAPE CELL

Clifford Harold Pountney and Edward Francis Miller, Harrisburg, Pa., assignors to AMP Domestic Inc.

Original application Apr. 28, 1969, Ser. No. 819,548, now Patent No. 3,577,281, dated May 4, 1971. Divided and this application Sept. 30, 1970, Ser. No. 76,945
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 A 19 Claims



A rechargeable cell comprising, in a charged state, a bulk aqueous electrolyte of potassium hydroxide saturated with zinc oxide; a cathode; and an anode comprising a long steel tape coated with zinc on its active surface. The tape is driven from a storage reel through a region in the electrolyte adjacent to the cathode, and onto a takeup reel, at speeds dependent on the load current or voltage, or both. During charging, the tape is driven in the opposite direction. The cathode may be a stationary air permeable electrode; or it may comprise a tape similar to the anode tape and similarly driven, coated with silver oxide on its active surface.

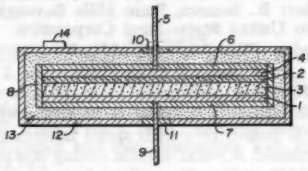
3,725,132
SOLID STATE THERMALLY ACTIVE BATTERY

James R. Moser, New Freedom, Pa., and Alan A. Schneider, Baltimore, Md., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed Sept. 14, 1970, Ser. No. 71,765
Int. Cl. H01m *11/00*
U.S. Cl. 136—90 3 Claims

A solid state battery activated on heating, suitably by an integral combustible chemical charge, has a silver or

copper anode, a depolarizer cathode and a solid salt electrolyte that is substantially non-conductive at normal



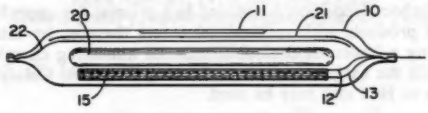
ambient temperature but that becomes ionically conductive when heated.

3,725,133

ELECTRIC CURRENT PRODUCING CELL

Michael J. Pollack, Lansdale, and Evert C. Weidner, Philadelphia, Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 29, 1970, Ser. No. 85,122
Int. Cl. H01m *21/00*
U.S. Cl. 136—114 **1 Claim**



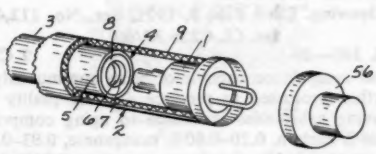
An inexpensive and simply constructed battery, having good storage properties prior to use. The battery is comprised of an anode, cathode, and a separator located within a first plastic pouch. Also within the first pouch is a second inner pouch containing a solution of electrolyte chemicals. For activation of the battery the inner pouch is ruptured, thereby bringing the electrolyte into contact with the remaining active elements of the battery. A portion of the outside pouch is formed of a gas permeable membrane to allow dissipation of gas and thereby prevent bursting of the battery. To prevent or minimize the likelihood of direct contact by the liquid electrolyte with the permeable membrane, a labyrinth comprised of a pair of overlapping baffles is interposed between the battery and the permeable membrane.

3,725,134

EXPENDABLE IMMERSION THERMOCOUPLE UNIT

Richard W. Gessner, Massillon, and Roy E. Davies, Terrace Park, both of Ohio, assignors to Massillon Measurement, Inc., Massillon, Ohio

Filed April 23, 1970, Ser. No. 31,080
Int. Cl. H01v *1/02*
U.S. Cl. 136—234 **15 Claims**



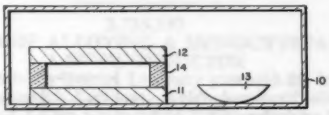
An expendable immersion thermocouple in which the thermocouple and its support and the plug are separate assemblies which may be assembled and tested before mounting in the protective housing.

3,725,135

PROCESS FOR PREPARING EPITAXIAL LAYERS OF $HG_{1-x}CD_xTE$

Robert J. Hager; Maurice L. Hitchell, both of Minneapolis, and Obert N. Tufte, Hopkins, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1968, Ser. No. 766,260
Int. Cl. H01l *3/20*
U.S. Cl. 148—1.5 **23 Claims**



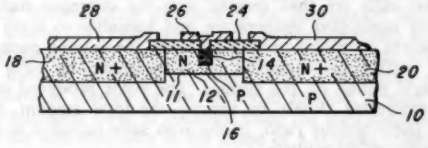
An isothermal process for preparing epitaxial layers of $Hg_{1-x}CdbxTe$ in an excess mercury vapor environment. In a preferred embodiment the process provides layers having a predetermined x value within the $Hg_{1-x}Cd_xTe$ alloy system by the selection of a predetermined mercury vapor pressure during processing.

3,725,136

JUNCTION FIELD EFFECT TRANSISTOR AND METHOD OF FABRICATION

Ian H. Morgan, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 1, 1971, Ser. No. 148,764
Int. Cl. H01l *11/14, 7/54*
U.S. Cl. 148—1.5 **8 Claims**



A junction field effect transistor is fabricated in an intrinsic silicon substrate. Using ion implantation is utilized to control the impurity profile of the channel and electron beam pattern definition provides an extremely narrow gate region providing a JFET having near optimum characteristics.

3,725,137

METHOD FOR THE BLACKENING OF ALUMINUM ALLOYS

Cesar Adrianus Boose, Hague; Maarten Johan Reidt, Voorburg, and Evert Hermanus Lodewijk Derksen, Weesp, all of Netherlands, assignors to Reactor Centrum Nederland, The Hague, Netherlands

Filed March 10, 1971, Ser. No. 123,051
Int. Cl. C23f *7/26*
U.S. Cl. 148—6.2 **6 Claims**

An even, tenacious black coating is applied to the surface of copper-containing aluminum alloys by immersion of the alloy

into an aqueous bath containing from 10-20 g/l of an alkali, metal bichromate and from 8-50 g/l of an alkali metal hydroxide for a period up to 1.5 minutes according to the disclosed process. Preferably the aqueous bath also contains from 30-40 g/l of an alkali metal carbonate.

3,725,138

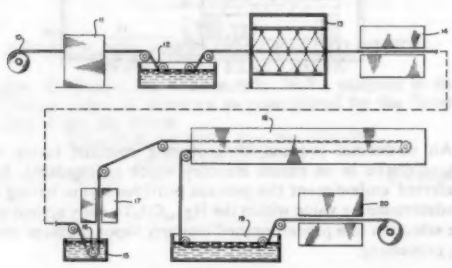
PRODUCTION OF SYNTHETIC PATINA

Ronald B. L. Jones, Watertown, Conn., assignor to Anaconda American Brass Company, Waterbury, Conn.

Continuation-in-part of abandoned application Ser. No. 762,925, Sept. 26, 1968. This application Mar. 15, 1971, Ser. No. 124,480

Int. Cl. C23f 7/00

U.S. Cl. 148—6.14 **15 Claims**



A decorative synthetic patina is produced on a cupreous surface by coating the surface with an aqueous acid solution containing salts in about the following weight percent, dry basis, 10–20% iron sulfate, 13–21% sulfamic acid, and the balance ammonium sulfate, the required strength of the bath being a function of the withdrawal rate of the cupreous surface. The salts thus applied are dried forming a reactant coating on the cupreous surface. These salts are then reacted with the cupreous surface under controlled temperature and humidity to form an adherent corrosion product. Finally, the soluble parts of the coating are dissolved out, developing the color of natural patina on the surface. The color produced may be controlled closely by varying the total amount, and the ferric-ferrous ratio, of the iron salts included in the aqueous acidic solution.

An article colored by the process has a natural patina appearance having a corrosion product with about the following percentages by weight: 47–54% copper, 17–23% sulfate, approximately 1% sulfamate, 0.7–2% iron, water less than 3% and the remainder hydroxide.

3,725,139

METHOD FOR IMPROVING PERFORMANCE OF HIGH FREQUENCY CABLE

Alfred Staschewski, Langenhagen, Rudolf Pflaum and Helmut Martin, Hannover, and Helmut Hildebrand, Langenhagen, Germany, assignors to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

No Drawing. Filed Feb. 3, 1971, Ser. No. 112,460

Claims priority, application Germany, Feb. 26, 1970, P 20 08 895.3

Int. Cl. C23f 1/24; H01b 7/34

U.S. Cl. 148—6.31 **5 Claims**

A high frequency cable with gaseous e.g. air space insulation between an inner and an outer conductor is improved by temporarily exposing the conductors to layer forming corrosion.

3,725,140

METHOD FOR INCREASING THE HEATING RATE IN CONTINUOUS ANNEALING PROCESSES

Edward J. Patula, Monroeville Borough, William L. Roberts, Franklin Township, Westmoreland County, and Robert R. Somers, Penn Hills Borough, Pa., assignors to United States Steel Corporation

No Drawing. Filed Mar. 29, 1971, Ser. No. 129,183

Int. Cl. C21d 7/00

U.S. Cl. 148—12.1 **1 Claim**

In the continuous annealing of steel strands, the hot rolled coil is passed to a high speed tandem mill where it is cold reduced. A water soluble rolling lubricant is employed to both reduce the rolling forces and to subsequently act as an emissivity increasing film. The steel strand, with the film of lubricant (0.5 to 10.0 microinches thick) adhering to its surfaces, is passed to a radiant heating, annealing furnace. Subsequent to annealing, the strand is cooled and the lubricant removed by well-known means.

3,725,141

ANNEALING STEEL PRODUCTS

Uno T. Hill, Gary, Ind., assignor to Inland Steel Company, Chicago, Ill.

No Drawing. Filed Nov. 10, 1971, Ser. No. 197,317

Int. Cl. C21d 1/76

U.S. Cl. 148—16 **15 Claims**

Carbon deposition is avoided in a process for annealing steel products with residual lubricants thereon, by introducing a lower alkyl alcohol into the annealing chamber during the early stages of the heating processes. Catalysts such as HCl also may be used.

3,725,142

ATOMIZED STEEL POWDER HAVING IMPROVED HARDENABILITY

Robert A. Huseby, Milwaukee, Wis., assignor to A. O. Smith-Inland Inc., Milwaukee, Wis.

Filed Aug. 23, 1971, Ser. No. 174,159

Int. Cl. B22f 3/24, 1/00

U.S. Cl. 148—16 **11 Claims**

Atomized steel powder having improved hardenability by the addition of boron. The powder is produced by atomizing a molten stream of steel containing 0.06 to 0.12 percent carbon and 0.005 to 0.100 percent boron. Following the atomization, the particles are annealed at a temperature of about 1500° to 2100° F. to soften the steel, as well as reducing the carbon content to a value below 0.05 percent. The annealed steel contains about 0.001 to 0.012 percent boron. After annealing, the cake-like structure is broken up to restore the as-atomized particle size and the particles are subsequently compacted into the shape of the desired part, sintered and heat treated to develop the desired hardness. The addition of boron aids in improving the hardenability of the part during heat treatment.

3,725,143

AGING RESISTANT COLD ROLLED SHEET PRODUCTS

Harry M. Alworth, Monroeville Borough, and Sumner H. Kalin, Wilkinsburg Borough, Pa., assignors to United States Steel Corporation

No Drawing. Filed Feb. 3, 1971, Ser. No. 112,444

Int. Cl. C22c 39/00

U.S. Cl. 148—36 **7 Claims**

A steel composition capable of being continuously cast and further processed to produce drawing-quality sheet steel having substantial resistance to aging comprising: 0.01–0.08% carbon, 0.20–0.60% manganese, 0.03–0.08% silicon, up to 0.015% aluminum, less than 0.01% boron and other usual steelmaking impurities such as nitrogen and oxygen. It is essential that sufficient boron be included to provide a boron to nitrogen ratio of 1.4 to 2.5

when the oxygen content exceeds 150 p.p.m., or a ratio of 1.0 to 1.4 when the oxygen content is less than 150 p.p.m. In further processing the steel to sheet products, it is essential that the hot rolled product be coiled at a temperature above 1100° F.

3,725,144

HEAT TREATABLE CREEP RESISTANT SOLDER

Douglas J. Harvey, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

No Drawing. Original application Apr. 16, 1968, Ser. No. 721,597, now Patent No. 3,600,164, dated Aug. 17, 1971. Divided and this application Feb. 4, 1971, Ser. No. 112,763

Int. Cl. C22f 1/12

U.S. Cl. 148—127 **3 Claims**

The creep resistance of an alloy consisting essentially of 10% to 20% bismuth, 0% to 5% tin, 0% to 0.2% of an element taken from the group of indium, cadmium and copper, and the balance lead can be improved by heating the alloy, preferably at about 300° to 400° F. for about one hour, and then cooling the alloy to normal room temperature.

3,725,145

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICES

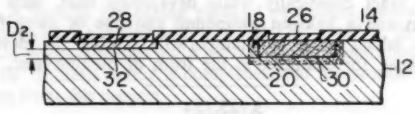
Michiyoshi Maki, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 27, 1970, Ser. No. 23,235

Claims priority, application Japan, Mar. 28, 1969, 44/23,108

Int. Cl. H01l 7/44

U.S. Cl. 148—175 **2 Claims**



Semiconductor devices containing two diffused regions with different depths formed in a common semiconductor substrate are made by, for example, first selectively diffusing germanium into the surface of an N-type silicon crystalline substrate and, thereafter, selectively diffusing boron into the region containing then diffused germanium as well as into another surface portion of the substrate where the germanium has not been diffused.

3,725,146

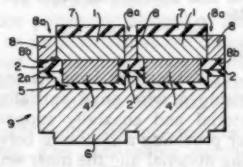
FABRICATION OF INTEGRATED MICRO-CIRCUITS UTILIZING DIELECTRIC-P-N JUNCTION ISOLATION

Manfred Roder, Dresden, Germany, assignor to Arbeitsstelle fur Molekularelektronik, Dresden, Germany

Continuation-in-part of application Ser. No. 14,794, Mar. 2, 1970, which is a continuation of application Ser. No. 703,756, Feb. 7, 1968, both now abandoned. This application Nov. 12, 1970, Ser. No. 88,963

Int. Cl. H01l 5/00, 7/00, 19/00

U.S. Cl. 148—175 **3 Claims**



A semiconductor device for integrated microcircuits having a number of functional elements, includes a semiconductor substratum, a dielectric insulation layer disposed on the substratum, low-ohmic highly doped semiconductive layers located in the regions of respective functional elements. A dielectric insulation layer coats the bottom and side surfaces of the low-ohmic layers, with the thickness of the dielectric insulation layer being greater in the regions between the low-ohmic layer. Semiconductive body layers adjoin the open upper surface of the low-ohmic layers and overlap the periphery of the top surface of the side portions of the dielectric insulation layer. The semiconductive body layers have the same type of conductivity as the low-ohmic layers. P-N junctions disposed on the dielectric insulation layer form lateral insulation frames around respective semiconductive body layers. Third insulating layers are provided on the upper surface of respective functional elements.

3,725,147

METHOD OF ALLOYING A MONOCRYSTAL OF A SEMICONDUCTOR

Natan Moiseevich Roizin, Leninsky prospekt 89, kv. 408; Igor Naumovich Larionav, Kalanchevskaya ulitsa 63, kv. 11; and Alvina Grigorievna Kolesova, ulitsa Pravdy 17/19, kv. 49, all of Moscow, U.S.S.R.

Original application Nov. 17, 1967, Ser. No. 684,039. Divided and this application Aug. 25, 1970, Ser. No. 66,907

Int. Cl. H01l 7/48

U.S. Cl. 148—183 **6 Claims**

A method of alloying the crystallographic oriented surface of a monocrystal of an electrically conductive body, making it possible to obtain an alloyed region in the form of a straight prism. In the case of a monocrystal body having a diamond-type lattic and a crystallographic surface oriented in the plane (110), an alloyed region is obtained in the form of a straight trihedral prism, whose two side faces coincide with the planes (111), and the third face coincides with the surface of the initial monocrystal, the prism axis coinciding with the direction <110>. Alloying is effected by movement of the molten zone of alloying material which is caused by passing direct current through the crystal so that the density vector of the electric current is parallel to the crystal surface to be alloyed, which is oriented in the plane (110) and coincides with the direction <110>, parallel to the surface being alloyed. This direction is an intersection line of the planes (111) of maximum atom packing which shape a "guide groove" in which the molten region of the alloying material is caused to move. When monocrystal germanium is alloyed by the aforesaid method, a strip recrystallization layer is obtained from the melt containing gallium and antimony in the shape of a straight trihedral prism oriented in the above manner.

3,725,148

INDIVIDUAL DEVICE TUNING USING LOCALIZED SOLID-STATE REACTIONS

Don Leslie Kendall, 608 Kirby, Richardson, Tex.

Filed Aug. 31, 1970, Ser. No. 68,099

Int. Cl. H01l 7/34

U.S. Cl. 148—186 **10 Claims**

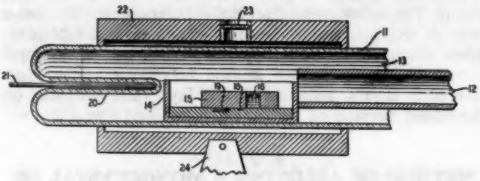
The characteristic parameters of an individual semiconductor device in an array or circuit are tuned by localized heat treatment causing solid-state reactions. Neighboring devices, if adequately separated, would be little affected. As a result, devices in an array for example can either be very closely matched or adjusted in an arbitrary or step function fashion from device to device. In an array of diodes fabricated from oxygen doped silicon, for example, current is passed (reverse or forward) through a single diode in an array. If the whole array were at 300° C. and a single p^+n diode was biased to a local temperature of 500° C., the diode would become more n-type, thereby lowering its breakdown voltage. Conversely, an n^+p diode would become less p-type, thereby raising its breakdown voltage.

3,725,149

LIQUID PHASE DIFFUSION TECHNIQUE

Marc Ilegems, Madison, and Morton B. Panish, Springfield, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Oct. 28, 1970, Ser. No. 84,790
Int. Cl. H01l 7/34, 7/38
U.S. Cl. 148—186 12 Claims



Impurities are diffused into a substrate by placing the impurities into a solution saturated with respect to the substrate material at the diffusion temperature. The solvent is subsequently brought into intimate contact with the substrate, a constant temperature being maintained during diffusion. Among others, the diffusion of Group II impurities into Group III–V compounds is described in detail.

3,725,150

PROCESS FOR MAKING A FINE GEOMETRY, SELF-ALIGNED DEVICE STRUCTURE

William L. George, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 29, 1971, Ser. No. 193,853
Int. Cl. H01l 7/44
U.S. Cl. 148—187 2 Claims

A fine geometry, self-aligned device structure is fabricated by interspersing diffusion and pattern steps, including preferential etching, by which line widths of one micron, and pattern repeat distances of five microns in transistors, are easily attained.

3,725,151

METHOD OF MAKING AN IGFET DEVICE WITH REDUCED GATE-TO- DRAIN OVERLAP CAPACITANCE

Demir S. Zoroglu, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 29, 1971, Ser. No. 193,961
Int. Cl. H01l 7/44
U.S. Cl. 148—187 3 Claims

The disclosure teaches a method for producing an IGFET device characterized by an extremely narrow gate area with no overlapping of the source and drain regions. A controlled etch is used to form a pattern in a first layer over the substrate to precisely define the gate width. The substrate is subsequently oxidized so that the material covering the gate area can be preferentially etched away, thereby creating a window precisely defining the gate electrode. The need for precisely registering masks is avoided. A superior IGFET with greater speed of response and other concomitant advantages results.

3,725,152

POLYMERIC BINDERS FOR USE IN HYBRID ROCKET PROPELLENTS

Earl T. Niles, Midland, and Don L. Stevens, Sanford, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 3, 1971, Ser. No. 139,821
Int. Cl. C06d 5/10
U.S. Cl. 149—19 6 Claims

Disclosed is a novel binder system suitable for use in a hybrid rocket propellent. The binder involves the copolymeric reaction product of a polyethylene imine and an epoxy terminated polypropylene oxide. The amine hydrogen/epoxide functionality ratio is sufficiently high to provide a polymer rich in nitrogen.

3,725,153

MASS WHICH AFTER IGNITION SUPPLIES HEAT FOR SOME TIME AS A RESULT OF A REACTION AMONG SEVERAL CONSTITUENTS OF THE MASS

Johann Schröder, Aachen, Germany, and Roland Anton Johan Otto van Witteveen, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1971, Ser. No. 175,466
Claims priority, application Netherlands, Aug. 29, 1970, 7012828
Int. Cl. C06b 15/00, 21/02; F24i 1/04
U.S. Cl. 149—19 4 Claims

A mass was found which can supply heat for some time after ignition. The mass consists of materials which mutually react chemically while developing heat, such as lithium and a halogen compound and one or more fluorides which serve for temporarily storing the developed heat, for example, in the form of melting heat.

3,725,154

MESA BURNING GAS GENERATOR PROPELLANT

Charles R. McCulloch and Bertram K. Moy, Shalimar, Fla., and Thomas C. Randle, Oxon Hill, Md., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed June 23, 1972, Ser. No. 265,938
Int. Cl. C06b 11/00
U.S. Cl. 149—21 10 Claims

A gas generating composite propellant having plateau and mesa burning characteristics, and containing a primary oxidizer which can vary in size from about 5 microns to about 20 microns and a coolant oxidizer which can vary in size from about 40 microns to about 600 microns.

3,725,155

METHOD OF PREPARING FULMINATING MATERIAL FOR PHOTOFLASH LAMP

Thomas B. McDonough, Allenwood, Pa., assignor to Sylvania Electric Products Inc.

Original application Nov. 20, 1970, Ser. No. 91,252. Divided and this application Nov. 22, 1971, Ser. No. 201,226
Int. Cl. C06f 3/06
U.S. Cl. 149—31 6 Claims

A percussive-type photoflash lamp having a primer of the type comprising a wire anvil partially coated with fulminating material and coaxially supported within a tube in a manner providing a clearance between the coating of fulminating material and the inner wall of the tube. The fulminating material contains sodium chlorate as the oxidizer and is prepared by mixing an aqueous slurry containing red phosphorus with an aqueous solution of dissolved sodium chlorate.

3,725,156

IGNITION COMPOSITION INITIATED BY WATER

Tommy Lewis Thompson, Melbourne, Fla., assignor to Life Support, Inc., Melbourne, Fla.

Filed April 28, 1971, Ser. No. 138,326
Int. Cl. C06b 11/00
U.S. Cl. 149—81 11 Claims

An ignition cone composition including an alkaline metal or alkaline earth metal iodide or oxyiodide in combination with a principal oxidizer consisting of an alkaline metal mono-oxide and usually, an auxiliary oxidizer consisting of one or more alkaline metal and alkaline earth metal peroxides and chlorates which term includes the chlorates and perchlorates. This composition is included as a separate top layer in compressing a chemical oxygen generator composition or other composition to be ignited by the ignition cone compositions. In the preferred form, a water filled fracturable vial is associated with said layer so that upon fracture, the water causes initiation of said ignition cone composition, usually best preformed through the use of an uncompacted or loose powder first fire composition of similar content as said ignition cone composition.

3,725,157

METHOD OF CURING DOUBLE BASE PROPELLANTS

Dominic A. Berta, Wilmington, Del., assignor to the United States of America as represented by the Secretary of the Navy

Filed Feb. 2, 1972, Ser. No. 222,973
Int. Cl. C06b 5/04
U.S. Cl. 149—97 10 Claims

A process for curing plastisol propellant formulations comprising a curing step at about 120°–145° F. for about 2–6 hours followed by a curing step at from about 80°–110° F. until curing is completed, and the product resulting from this process.

3,725,158

MULTI-COMPONENT POWDERLESS ETCHING BATH ADDITIVE

Harold J. Messerschmidt, Jr., Stockholm, Karl Heyman, Montclair, and Bernadou W. Johnsen II, Paterson, N.J., assignors to Mona Industries, Inc., Paterson, N.J.

No Drawing. Filed Mar. 29, 1972, Ser. No. 239,340
Int. Cl. B44n 3/02; C23g 1/26
U.S. Cl. 156—14 33 Claims

Improved powderless etching bath additive compositions, especially for etching magnesium photo-engraving plates, containing:

(a) at least one water-soluble or water-dispersible sulfonated fatty acid of from 8 to 24 carbon atoms, wherein the sulfur atom in the sulfonate group is directly bonded to a carbon atom;
(b) at least one saturated or olefinically unsaturated mono-carboxylic acid of from 8 to 24 carbon atoms;
(c) at least one lower mono-carboxylic acid of from 2 to 6 carbon atoms and/or poly-carboxylic acid of from 2 to 10 carbon atoms;
(d) at least one polyhydric alcohol of from 2 to 10 carbon atoms or an ether derivative thereof, and
(e) at least one alkylaryl sulfonate having from 6 to 12 carbon atoms in the aryl moiety and having from 8 to about 18 carbon atoms in each alkyl moiety,

and etching baths containing such compositions and nitric acid and water, give outstanding etching performance, particularly improved definition of the printable area of the plate, depth of the half-tones, side wall smoothness, and, particularly, control of side wall slope and substantial elimination of hooking at print line points.

3,725,159

POWDERLESS ETCHING BATH COMPOSITIONS

Harold J. Messerschmidt, Stockholm, Karl Heyman, Montclair, and Bernadou W. Johnsen II, Paterson, N.J., assignors to Mona Industries, Inc., Paterson, N.J.

No Drawing. Filed Mar. 29, 1972, Ser. No. 239,385
Int. Cl. B44n 3/02; C23g 1/26
U.S. Cl. 156—14 21 Claims

Improved powderless etching bath additive compositions, especially for etching magnesium photoengraving plates, comprising:

(a) at least one water-soluble or water-dispersible sulfonated fatty acid of from 8 to 24 carbon atoms, wherein the sulfur atom in the sulfonate group is directly bonded to a carbon atom, and
(b) at least one saturated or olefinically unsaturated monocarboxylic acid of from 8 to 24 carbon atoms, and
(c) at least one lower monocarboxylic acid of from 2 to 6 carbon atoms and for polycarboxylic acid of from 2 to 10 carbon atoms;

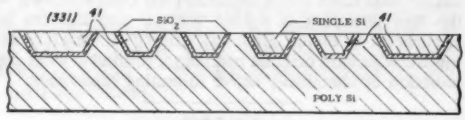
and etching baths containing such compositions and nitric acid and water, give good etching performance, particularly improved definition of the printable area of the plate, depth of half-tones, and side wall smoothness.

3,725,160

HIGH DENSITY INTEGRATED CIRCUITS

Kenneth E. Bean, Richardson, and Richard L. Yeakley, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1970, Ser. No. 102,585
Int. Cl. H01l 7/00
U.S. Cl. 156—17 10 Claims



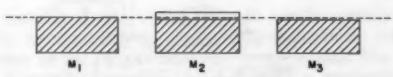
Monocrystalline silicon and other cubic crystals are preferentially etched to provide grooves having symmetrical sidewalls sloped at angles of 72.45° or 46.51°. A {100} surface of the crystal is selectively masked to provide apertures aligned with an intersection of a {113} plane located in a <310> direction, or a {331} plane located in a <310> direction. The etched semiconductor crystal is used to fabricate integrated circuits having increased component packing density and/or optimized isolation moat angles for lead metallization.

3,725,161

OXIDATION OF SEMICONDUCTIVE ALLOYS AND PRODUCTS OBTAINED THEREBY

Alan B. Kuper, 2265 Delaware Drive, Cleveland Heights, Ohio 44106

Filed Mar. 3, 1971, Ser. No. 120,448
Int. Cl. B44d 5/12; H01l 11/00
U.S. Cl. 156—17 14 Claims



There is provided a process for producing from certain semiconductive alloys, e.g. an alloy of silicon and germanium, with or without dopants, a composite body having an oxidized coating on a bulk body of the alloy, and

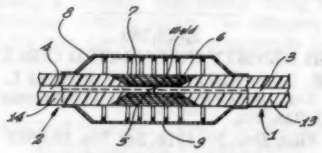
in which there is an increased concentration of one of the elements, e.g. germanium, at the interface and in the subsurface and whereby the oxide composition is controlled and wherein the bulk body of the alloy is subjected to a predetermined number of operational cycles from 1 to 10 or more, each cycle including oxidation, e.g. thermal oxidation, in a chemically oxidizing environment, e.g. an oxygen-containing or yielding gaseous medium. Following oxidation, etching of the oxide coating may optionally be performed, or an oxidation/etching cycle repeated. Novel semiconductor materials are obtained by this process which afford advantages in fabrication and performance of devices.

3,725,162

METHOD AND EQUIPMENT FOR COMPLETING CONNECTION OF CABLE ENDS

Hans-Dieter Stenzel, Hannover, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed June 2, 1970, Ser. No. 42,752
Claims priority, application Germany, June 14, 1969, P 19 30 303.8
Int. Cl. H01b *13/08*
U.S. Cl. 156—53 **14 Claims**



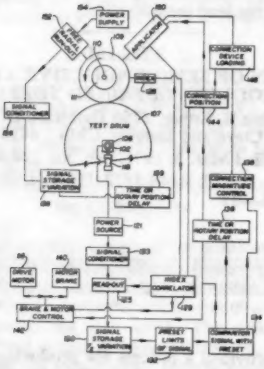
Insulating tape is wrapped around interconnected conductor ends from which insulation has been removed, and the tape wrapping is welded through non-uniform heat application to obtain gradually sloping temperature drop toward adjoining original insulation, to inhibit local accumulation of chemically active migrating substances.

3,725,163

METHOD OF IMPROVING PERFORMANCE CHARACTERISTICS OF PNEUMATIC TIRES

Clarence Hofelt, Jr., Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company

Continuation-in-part of application Ser. No. 613,252, Feb. 1, 1967. This application July 21, 1970, Ser. No. 57,384
Int. Cl. F16f *15/00*
U.S. Cl. 156—64 **16 Claims**



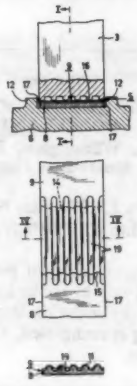
Structural nonuniformity in pneumatic tires gives rise to self-excited force variations when the tire is rotated along a surface, such as a roadway. These force variations, when at an unacceptable level, can adversely affect the ride of a vehicle supported by pneumatic tires causing, for example, vehicle shake, noise, roughness, and slight steering disturbances. These variations are reduced to an acceptable level by subjecting the tire to a corrective action comprising applying a small amount of an adhering substance to the tread of the tire at a certain location or locations.

3,725,164

METHOD OF BONDING A LEADER TO MAGNETIC TAPE

Walter Albinger and Karl Heitzer, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 1, 1971, Ser. No. 148,418
Claims priority, application Austria, June 5, 1970, A 5,053/70
Int. Cl. B29c *27/08*; G03d *15/04*
U.S. Cl. 156—73 **14 Claims**



The invention relates to a method and apparatus for bonding an end of a magnetic tape to an end of a thermoplastic leader tape. The magnetic tape has a base of thermoplastic material which is coated on one side. The end of the magnetic tape is placed on the end of the leader tape so as to be an overlapping relationship. An ultrasonic vibration field is applied to the overlapping tapes for a brief period of time and a static pressure is simultaneously exerted on the tapes by the vibrator. The ultrasonic field is concentrated in a strip-shaped area extending in the longitudinal direction of the tapes and is oriented at right angles to the plane of the tapes. The field has a width which is at least equal to the width of the narrower of the tapes and an overall length which is greater than the spacing between the ends of the two overlapping tapes.

3,725,165

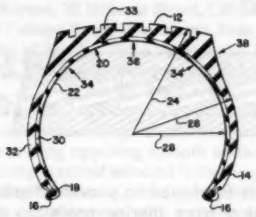
METHOD FOR MANUFACTURE OF A MORE UNIFORM PNEUMATIC TIRE

Lawrence R. Sperberg, 6740 Fiesta Drive, El Paso, Tex. 79912

Filed June 19, 1970, Ser. No. 37,054
Int. Cl. B29h *17/26*
U.S. Cl. 156—123 **11 Claims**

A tire which may be a bias, a belted bias, or belted radially constructed tire. After all the elements have been assembled and the tire is ready for vulcanization, it is preheated to a temperature range of 140° to 230° F. while the individual tire cords are simultaneously subjected to a pulse tension. The green unvulcanized tire is first expanded into a configuration approximating that of the final tire shape then preheated by circulating a heating medium through the shaping or curing bag which

serves as a source of heat to warm the tire as well as the means for expanding the tire so that the before mentioned tension is applied to the individual tire cords. The internal pressure of the heating medium may be maintained constant, or may be allowed to pulse through

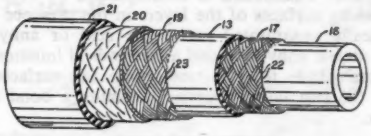


maximum and minimum values in the range of 2% to 10% of the cord tensile strength, thereby altering the tension on the individual tire cords. At the completion of the cord relaxation step the tire is inserted into the curing mold and subjected to the normal cure cycle.

3,725,166
METHOD OF MAKING REVERSIBLE, NONWOVEN MATERIAL
Donald M. McCord, Greenville, S.C., assignor to Phillips Petroleum Company
Filed Apr. 13, 1970, Ser. No. 27,749
Int. Cl. B32b *31/20*
U.S. Cl. 156—148 **3 Claims**

A reversible, nonwoven, fibrous material formed of first and second different colored bats forming said material which has different colored first and second surfaces and the process for making said material.

3,725,167
METHOD OF MAKING WIRE BRAID HYDRAULIC HOSE
Fred W. Love and William J. Hunt, Youngstown, Ohio, assignors to Aeroquip Corporation, Jackson, Mich.
Continuation-in-part of application Ser. No. 538,488, Mar. 17, 1966, which is a continuation-in-part of application Ser. No. 189,811, Apr. 24, 1962, both now abandoned. This application Nov. 15, 1971, Ser. No. 198,971
Int. Cl. B31c *13/00*; F16l *11/10, 11/16*
U.S. Cl. 156—143 **5 Claims**



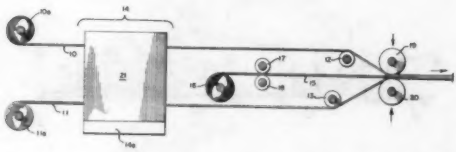
A method of making a wire braid hydraulic hose which when made according to certain specifications will have a known average burst pressure and a known average life of pressure impulse cycles wherein the hose is subjected, immediately after curing, to an internal pressure of approximately 80 to 95 percent of the known burst pressure, maintaining said pressure momentarily and relieving the same whereby the individual wires of the braid will be realigned and repositioned into a permanent close contact with each other so as to substantially increase the strength of the hose and increase the number of pressure impulse cycles it will withstand well above the known average to thereby increase the life expectancy of the hose.

3,725,168
METHOD OF SPLICING THE TWO ENDS OF FILM STRIPS
Robert S. Rosborough, Jr., Rochester, and Luther M. Wright, Brockport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Original application Sept. 3, 1969, Ser. No. 854,886, now Patent No. 3,634,171. Divided and this application Mar. 18, 1971, Ser. No. 125,841
Int. Cl. B31f *5/00*; G03d *15/04*; G03f *1/00*
U.S. Cl. 156—157 **1 Claim**

A method and apparatus for splicing and identifying web or film strips comprising the steps of splicing individual lengths of a web into a substantially continuous strip while providing the proper repetition of steps to assure that the web is not mis-identified. The splicing and identification apparatus provides means for accurately aligning and spacing the web to obtain the necessary splice characteristics and includes sequential interlocks which assure the completion of all splicing and identification procedures in the proper order.

The two web ends are aligned and held in splicing relationship at an applicator station. An indicia-bearing member is applied first to a web identifier at the applicator station and then a corresponding indicia-bearing member is applied to the web ends at the applicator station to splice the ends together. Only after both indicia-bearing members have been applied, are the web ends moved from the applicator station.

3,725,169
BIMETALLIC LAMINATE AND METHOD OF MAKING SAME
Ralph W. Allen and Richard F. Marsh, Louisville, Ky., assignors to Anaconda Aluminum Company, New York, N.Y.
Continuation of application Ser. No. 696,648, Jan. 9, 1968, which is a continuation-in-part of application Ser. No. 621,258, Mar. 7, 1967. This application June 11, 1971, Ser. No. 152,446
Int. Cl. B31c *13/00*
U.S. Cl. 156—184 **9 Claims**

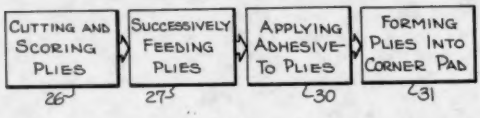


Two metallic sheets, which may be similar metals or dissimilar metals, such as aluminum and stainless steel, are bonded by an intermediate dry thermoplastic film to form a bimetallic laminate. According to a particularly advantageous embodiment of the invention layers to be laminated are wound onto a common core in a predetermined relationship and the three component assembly is then heated to activate the thermoplastic layer, bonding the layers together.

3,725,170
METHOD OF AND APPARATUS FOR FORMING CORNER PADS

Brendan L. Doll, Patterson, N.C., assignor to Cellu Products Company, Patterson, N.C.

Filed May 11, 1970, Ser. No. 36,332
Int. Cl. B65d 5/44, 25/24
U.S. Cl. 156—217 13 Claims



A method of and apparatus for forming corner pads utilizing a plurality of plies, each of which is adapted to be folded into a trihedral angle arrangement, wherein the plies are successively fed into juxtaposed relation while adhesive is applied to predetermined surfaces of certain of the plies, and the plies are successively formed into trihedral angle arrangements while being successively placed in contiguous, nesting relationship to secure the nested plies together by the adhesive to maintain the same in a collective trihedral angle arrangement.

3,725,171
PROCESS FOR THE MANUFACTURE OF SYNTHETIC LEATHER MATERIAL

Claude El-Baz Nouchy, 25 Rue Vital, Paris, France

No Drawing. Filed July 7, 1970, Ser. No. 53,019
Int. Cl. B44c 5/00
U.S. Cl. 156—230 13 Claims

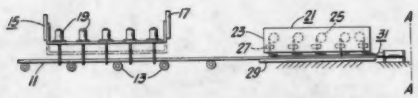
This invention relates to a process for the manufacture of synthetic leather particularly for boots vamp, comprising:

(a) impregnating a polyurethane elastomer foam having macroporous structure and communicating pores with a polyurethane elastomer dissolved in a solvent of the elastomer but non solvent of the foam;
(b) eliminating solvent by evaporation;
(c) compressing the impregnated foam cleared of solvent in order to obtain a microporous structure with communicating pores.

3,725,172
METHOD FOR PRODUCING LAMINATES

Frank Fekete, Monroeville, Leonard J. Pulman, Pittsburgh, and David J. Thrash, Ruffsdale, Pa., assignors to Koppers Company, Inc.

Continuation of abandoned application Ser. No. 868,094, Oct. 21, 1969. This application Oct. 27, 1971, Ser. No. 193,225
Int. Cl. B32b 31/00; B29c 19/00
U.S. Cl. 156—252 4 Claims



The method for producing continuous lengths of laminates includes forming a plurality of apertures in a substrate and inserting heat curable plastic material in the apertures; thereafter, laminae of heat curable plastic material are applied to opposite surfaces of the substrate and in contact with the plastic material in the apertures. The formed laminate is moved into a press where heat and pressure are applied to cure the plastic material, and then a cut off saw severs the continuous length of laminate into discrete lengths.

3,725,173
METHOD OF MAKING A PROTECTIVE DIVING SUIT

Clarence S. Johnson and Arthur F. Langguth, San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Jan. 13, 1972, Ser. No. 217,481
Int. Cl. B32b 31/00; B63c 11/04
U.S. Cl. 156—250 7 Claims

A diving suit is fabricated to provide freedom of motion and protection from marine predators including a pair of neoprene sheets sandwiching a fish scale arrangement of overlapping plastic chips. Using a resilient adhesive to bond row after row of interconnected plastic chips onto the inner sheet of neoprene in the overlapping "fish scale like" arrangement provides a protective laminate. Covering the joined rows with the second neoprene sheet holds the suit together and reduces the possibility of snagging the chips' exposed edges. Holes are made in the outer neoprene sheet and a liquid resilient adhesive is injected to coat the chips and fill any voids created between the two sheets. After a sufficient drying time, the laterally arranged rows of plastic chips are bent and flexed along axes perpendicular to the rows to break the small connecting portions between adjacent chips. Thusly resiliently bonded and segmented, the layered diver armor provides protection yet retains a high degree of flexibility to prevent diver fatigue.

3,725,174
THERMOPLASTIC POLYMER FILM-POLYHYDRIC POLYMER FILM LAMINATE

Norman G. Gaylord, New Providence, N.J., assignor to Champion International Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 702,204, Feb. 1, 1968, now Patent No. 3,654,939. This application Jan. 6, 1971, Ser. No. 104,504
Int. Cl. C09j 5/02
U.S. Cl. 156—305 7 Claims

The lamination of at least two layers of normally incompatible polymers is disclosed. One of the polymers is a highly hydrogen bonded polymer, such as cellulose, and the other polymer is a thermoplastic polymer, such as polyethylene. Lamination is accomplished by contacting the opposing surfaces of the layers in the presence of an ethylenically unsaturated carboxylic acid or anhydride, such as maleic anhydride and a free radical initiator. The maleic anhydride thereby reacts with the surfaces and couples the two layers together, forming a bond therebetween.

3,725,175
PROCESS FOR CURING POLYFERROCENYLENES

Norman Bilow, Los Angeles, Calif., and Harold Rosenberg, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the Air Force

No Drawing. Original application Mar. 6, 1969, Ser. No. 805,009, now Patent No. 3,640,963. Divided and this application Sept. 14, 1971, Ser. No. 180,528
Int. Cl. C09f 5/00
U.S. Cl. 156—327 7 Claims

A method of curing low molecular weight polyferrocenylenes. Low molecular weight polyferrocenylenes are reacted with 1,1'-ferrocenedicarboxaldehyde or a substituted ferrocenedicarboxaldehyde in the presence of a suitable catalyst. This reaction produces a low molecular weight copolymer which, when subjected to heat and pres-

sure, thermosets or cures to a hard, heat-resistant, radiation-resistant resin. The cured products of this invention are useful as resins in the formation of laminated structures.

3,725,176
HIGH TEMPERATURE BIS (EPOXYALKYL) CARBORANE ADHESIVES

Robert L. Barnes, 20 Hillman Street, Clifton, and Daniel Graftstein, 19 Catalpa Road, Morristown, both of N.J.

Division of Ser. No. 762,614, Sept. 25, 1968, Pat. No. 3,669,993. This application Feb. 4, 1971, Ser. No. 112,821
Int. Cl. B32b *27/38*
U.S. Cl. 156—330 **8 Claims**

The process of providing an adhesive junction between two workpieces having opposing smooth surfaces comprising the steps of mixing material selected from the group consisting of bis(epoxybutyl)carborane, bis(epoxypentyl)carborane, and bis(epoxyhexyl)carborane, with a curing agent selected from the group consisting of boron trifluoride ethylamine and 4,4'-diaminodiphenylsulfone, applying said mixture to the opposing surfaces, joining the surfaces and allowing the workpieces with the mixture therebetween to harden under heat and pressure.

3,725,177
PROCESS FOR BONDING ARTIFICIAL OR SYNTHETIC TEXTILE FIBERS TO RUBBER

Bernardino Vecellio and Fausto Casa, Milan, Italy assignors to Industrie Pirelli, S.p.A., Milan, Italy

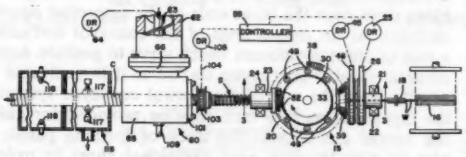
No Drawing. Filed Aug. 31, 1971, Ser. No. 176,722
Claims priority, application Italy, Sept. 2, 1970, 29,262/70
Int. Cl. B32b *31/00*; C09j *3/12*
U.S. Cl. 156—333 **10 Claims**

A process for improved bonding between artificial or synthetic textile fibers to rubber is disclosed wherein a polymer having double bonds and chlorine in its structure is grafted onto said fibers which are then placed into direct contact with the rubber followed by curing the rubber. No activation treatment is necessary.

3,725,178
APPARATUS FOR CONTINUOUSLY MANUFACTURED FLEXIBLE CONDUIT

Donald L. Kleykamp, 868 Heincke Drive, West Carrollton, Ohio; Ivan Gaster, Ratcliffe Cove, Rte. 3, Waynesville, N.C.; Vernon D. Browning, 401 Avery St., Waynesville, N.C. 28786; and Homer N. Holden, Box 502, Sylva, N.C. 28779

Filed Nov. 13, 1970, Ser. No. 89,333
Int. Cl. B28b *19/00*
U.S. Cl. 156—393 **12 Claims**

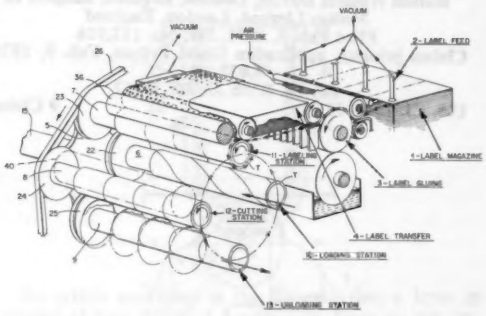


A wire is fed from a supply roll to a device which twists the wire on its longitudinal axis and continuously forms the twisted wire into a non-rotating helical coil. The coil is fed directly from the device through a plastic tube extruding head by a rotatable screw which extends within the coil, and a vacuum is created within the tube as it is extruded over the coil to shrink the tube between the turns of the coil. The coil reinforced tube may then be fed through a device which covers the tube with a continuous fabric member, and the covered tube is then fed through another extruder head which extrudes a second tube over the fabric member and shrinks the second tube onto the fabric member and the first tube. The coil feeding screw, the fabric member forming device, the extruders, and the tube feeding devices are driven at speeds correlated with the speeds of twisting and feeding the wire to provide a continuous conduit forming operation.

3,725,179
TUBE LABELING AND CUTTING MACHINE

Emil P. Kiss, Philadelphia, Raymond C. Onyx, Ambler, and Richard F. Fegley, Warminster, Pa., assignors to Paco Winders, Inc., Philadelphia, Pa.

Filed Sept. 17, 1971, Ser. No. 181,307
Int. Cl. B65c *9/04*
U.S. Cl. 156—448 **20 Claims**

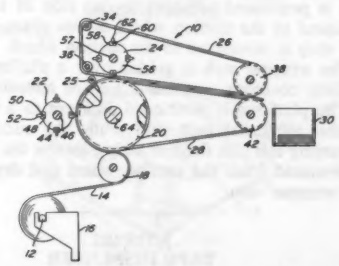


Machine to attach labels to tubes. A stack of labels are placed in a magazine and machine automatically carries out a sequence of operations. The labels are serially removed from the magazine and glue is applied to one side. The glued label is then wound around a tube. The labeled tube is moved to a cutting station where it is either trimmed or severed into several smaller tubes, each with its own label. The severed or trimmed tube is placed in another station and unloaded.

3,725,180
BAG-MAKING MACHINE FOR THERMOPLASTIC BAGS

Hercules Membrino, 1934 Arch St., Philadelphia, Pa. 19103

Continuation-in-part of application Ser. No. 874,523, Nov. 6, 1969, now Patent No. 3,616,095. This application Apr. 23, 1971, Ser. No. 136,862
Int. Cl. B32b *31/00*
U.S. Cl. 156—515 **12 Claims**



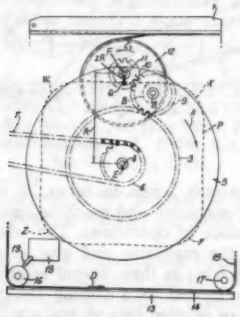
A bag-making machine comprising either a rotatable heat sealing means coacting with an impression roller to simultaneously seal and sever portions of a double ply or tubular thermoplastic strip to form individual bags. The sealing means comprises an assembly including one

or more heated knives, which assembly is so constructed that small portions along the length of the knives are prevented from severing the strip, thereby forming connecting means or "nips" between the bags. This is accomplished by forming small recesses in the knives or by providing a masking plate having areas which mask portions of the knives while contact is made with the strip. A rotatable severing means is provided downstream from the heat sealing means and coacts with the impression roller to sever the nips. A conveyor means is provided adjacent the severing means to support the completed and separated bags and to convey them from the machine.

3,725,181
APPARATUS FOR APPLYING TEAR STRIPS TO WRAPPERS

Robert William Davies, London, England, assignor to Molins Limited, London, England

Filed Feb. 5, 1971, Ser. No. 112,918
Claims priority, application Great Britain, Feb. 9, 1970, 6,030/70
Int. Cl. B32b *31/10, 31/12*
U.S. Cl. 156—519 **9 Claims**



Apparatus for applying a tear strip or the like to a wrapper web comprises a sun gear about which a planet carrier is rotated. A first planet gear meshes with the sun gear and also with a second planet gear, both being mounted on the planet carrier. A suction wheel is eccentrically mounted on the second planet gear, which results in the suction wheel rotating about the axis of the second planet gear and at the same time traversing a substantially rectilinear polygonal path as the planet carrier is rotated.

A device for cutting tear strips or the like from a web is positioned adjacent to one side of the polygonal path and as the suction wheel moves along this side the tear strip is wound on to the suction wheel.

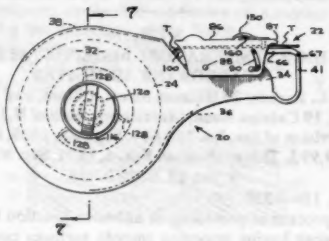
The wrapper web is guided over a platform, having a resilient covering, and has a line of adhesive applied to it. The platform is positioned adjacent to a different side of the polygonal path and while the suction wheel is traversing this side the tear strip contacts the adhesive and is unwound from the suction wheel and deposited on to the wrapper web.

3,725,182
TAPE DISPENSER

James L. Regan, 409 Dunkel St., Fairbanks, Alaska

Filed Aug. 17, 1971, Ser. No. 172,387
Int. Cl. B32b *31/18;* **B26f** *3/02*
U.S. Cl. 156—527 **29 Claims**

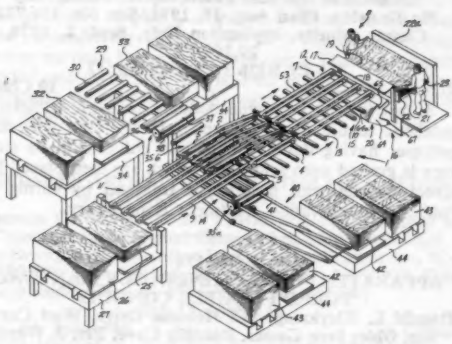
A hand-held tape dispenser is disclosed including a tape guide adjacent a cutting edge for enabling the application of tape into restricted areas such as a corner with the guide being movable to move the tape against the cutting edge following completion of a dispensing application to cut the tape in the innermost extent to which the tape is applied in such restricted areas.



3,725,183
AUTOMATIC PLYWOOD LAYUP MACHINE

Byron B. Brookhyser, Milton, Harold E. Erickson, Federal Way, and Glenn R. Perry, Tacoma, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 29, 1971, Ser. No. 128,780
Int. Cl. B32b *31/04;* **B65g** *57/00*
U.S. Cl. 156—563 **3 Claims**



An automatic plywood layup line is disclosed which is comprised of a plurality of vertically spaced generally horizontal in-line conveyor surfaces, each having an input end and output end. Several conveyor surface loader systems are laterally spaced from the conveyor surfaces and are adapted to spread selected veneer sheets with glue and place them over the input ends of the respective conveyor surfaces. At the output ends of the conveyor surfaces are a pair of sheet positioners which serve to position each individual sheet over a layup station as it is motivated outwardly from the end of the central conveyor system. At the layup station two men may be provided for guiding the veneer sheets onto the stack of forming panels and also to visually scan each individual sheet in order to minimize rejects.

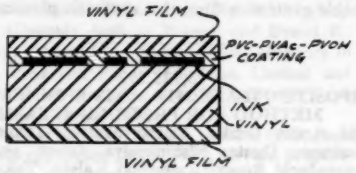
3,725,184
COATED VINYL FILM

Howard A. Scopp, Branford, Conn., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Feb. 4, 1971, Ser. No. 112,644
Int. Cl. B32b *27/04, 27/30, 31/12*
U.S. Cl. 161—6 **8 Claims**

A laminated article in which a composition containing polyvinyl chloride, polyvinyl acetate and polyvinyl alcohol is

interposed between a vinyl skin and the printing on the surface of a vinyl core to improve the adhesion between the skin and



the printing ink.

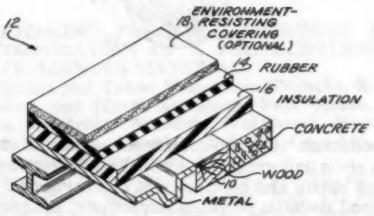
A method of laminating is also claimed.

3,725,185

PROTECTED STRUCTURAL AND CONSTRUCTION MATERIALS

Frank W. Curtis, Chagrin Falls, Ohio, assignor to Lexsuco, Inc., Solon, Ohio

Filed July 16, 1970, Ser. No. 55,447
Int. Cl. B32b *25/10*
U.S. Cl. 161—89 **10 Claims**



In various protective assemblies or systems for structural and construction materials, a water resistant sheet having a thickness within the range of about 1/100 to about 3/8 inch and being composed of from 50 to 100 wt. percent uncured rubber reclaim, and from 0 to about 50 wt. percent bituminous material.

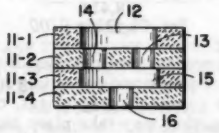
Specific protective assemblies or systems are described and claimed.

3,725,186

COMPOSITE CERAMIC ARTICLES

John F. Lynch, Oak Ridge, N.J., assignor to National Beryllia Corp., Haskell, N.J.

Filed Nov. 25, 1970, Ser. No. 92,775
Int. Cl. B32b *3/10*; C04b *39/00*
U.S. Cl. 161—109 **3 Claims**



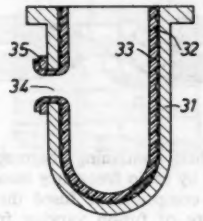
Dense monolithic bodies having complex internal cavities or passageways are made from sinterable powders by mixing the sinterable powders with an organic film-forming resin, forming a tape from the resin, cutting or stamping a multiplicity of disks, plates or chips from the tape which have the peripheral dimensions of the object to be made, stamping or cutting holes in the disks according to a predetermined pattern, laminating the disks to provide an object with the desired internal structure, and finally heat treating to remove the resin binder and sintering the powdered particles together to form a monolithic structure.

3,725,187

ARTICLE COMPRISING POLYTETRAFLUOROETHYLENE AND PROCESS FOR MAKING SAME

Pierre Viennot, Clamart, France, assignor to Societe Anonyme: Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 26, 1970, Ser. No. 5,485
Claims priority, application France, Jan. 31, 1969, 6902207; Jan. 16, 1970, 7001637
Int. Cl. B32b *15/08, 15/02, 31/20*
U.S. Cl. 161—111 **12 Claims**



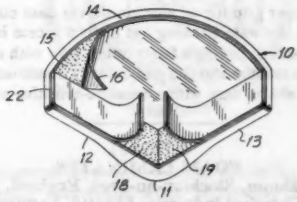
An article according to the invention has a layer or coating of pure PTFE of a certain thickness on one surface thereof, and on the other surface thereof, a thin layer of PTFE at least partially encasing the metal reinforcement. Such an article is perfectly suited to all the uses to which PTFE is normally put, and particularly the manufacture of apparatus and installations resistant to aggressive chemical products. Thus, a pipe of the aforesaid construction has a corrosion-resistant inner surface. Furthermore, the inner layer of PTFE passes through and partially encases the metal reinforcement which, on that account, is anchored in the material comprising PTFE. The article so obtained possesses mechanical resistance and dimensional stability which are very much greater than those of a similar article made of pure PTFE, the combination of a metal reinforcement and PTFE providing the article with mechanical properties similar to those possessed by the metal reinforcement alone.

3,725,188

PROTECTIVE PAD FOR FURNITURE ARTICLES

Bryson R. Kalt, 205 East 85th St., New York, N.Y.

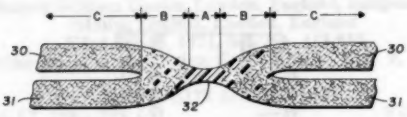
Filed Jan. 8, 1971, Ser. No. 104,891
Int. Cl. B32b *3/00*
U.S. Cl. 161—116 **5 Claims**



A protective pad which can be detachably secured to corners of furniture articles and the like, so that persons, particularly small children falling against the furniture corners, will not suffer from grevious injury. The pad is cushioned in three directions and is preferably constructed of foam rubber. When

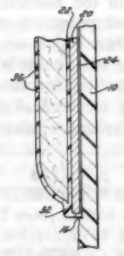
the protective pad is applied to the corners of an article of furniture, such as a table, persons falling against the table corner will receive only a minor bruise rather than suffering grevious bodily injury.

3,725,189
NON-TEAR SEAMS PRODUCED BY RADIO FREQUENCY MEANS
Lester Gidge, Nashua, N.H., assignor to Monsanto Company, St. Louis, Mo.
Filed Sept. 11, 1970, Ser. No. 71,554
Int. Cl. D04h *1/04;* **B32b** *31/20;* **B29c** *27/08*
U.S. Cl. 161—146 **2 Claims**



Layers of fabric containing thermoplastic fibers are bonded together by radio frequency means along a seam, the seam being comprised of fused thermoplastic fibers with the intensity of fusion varying from a maximum along a maximum bond area to a minimum along the edge of the seam to prevent the formation of a tear line between the fabric and the seam.

3,725,190
PAD FINGER GRIP FOR ELECTRIC SHAVER CASE
Frank W. Bostick, Lancaster, Pa., assignor to Schick Electric Inc., Lancaster, Pa.
Filed March 31, 1971, Ser. No. 129,754
Int. Cl. B32b *3/26, 5/18*
U.S. Cl. 161—159 **1 Claim**



A pad finger grip for an electric shaver case consisting of a vinyl-metal laminate backing cut to fit a recess in the shaver case, the backing having a foam outer layer with a vinyl cover sealed to its surface and the pad backing constructed to be affixed to the shaver case with a pressure-sensitive adhesive.

3,725,191
FOAM LAMINATES
Martin S. Bloom, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Sept. 20, 1971, Ser. No. 182,146
Claims priority, application Great Britain, Oct. 2, 1970, 47,035/70
Int. Cl. B32b *3/26;* **C09j** *7/02*
U.S. Cl. 161—160 **12 Claims**

A foam laminate comprising a rigid layer of a foamed synthetic plastics material confined between two skins wherein the outer face of at least one of the skins is provided with a decorative coating comprising a polymeric material and antimony powder, the exposed face of the decorative coating having laminated thereto a strippable protective film of a synthetic plastics material.

3,725,192
COMPOSITE FILAMENTS AND SPINNERET AND METHOD FOR PRODUCING SAME
Satoshi Ando, Osaka, Masao Matsui, Takatsuki, and Fumimaro Ogata, Nishinomiya, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan, and SNIA Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy
Continuation of application Ser. No. 706,023, Feb. 16, 1968. This application Aug. 31, 1970, Ser. No. 68,506
Claims priority, application Japan, Feb. 25, 1967, 42/11,961, 42/11,962, 42/11,963
Int. Cl. B29f *3/10;* **D02g** *3/00*
U.S. Cl. 161—175 **5 Claims**

Production of a two-component unitary filament having a given uniform cross-sectional configuration and comprising sheath and core portions consisting of a first and a second synthetic polymers respectively, and produced by separately fluidifying said polymers and simultaneously and concurrently feeding both polymers through a common spinneret orifice for extruding therefrom a composite filament, wherein the said second polymers forms a part of its cross-section, said part being both inwardly and outwardly enclosed by said first polymer and its major portion is located outside the concentric ½ similar shape of the cross-section of the filament.

3,725,193
PROCESS AND APPARATUS FOR THE CHEMICAL REACTION BETWEEN A GAS AND A WOOD PULP
Raimbault M. A. T. de Montigny, Baie d'Urfe, Quebec, Norman Liebergott, Laval, Quebec, and Derrick P. W. Pounds, Beaconsfield, Quebec, Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada
Filed May 27, 1970, Ser. No. 40,961
Claims priority, application Canada, Nov. 26, 1969, 68,411
Int. Cl. D21c *9/00*
U.S. Cl. 162—17 **19 Claims**

Process and apparatus are provided for simultaneously comminuting wood pulp and contacting such comminuted wood pulp with a suitable reagent gas, namely, ClO_2 or NH_3, so that reaction may take place between the wood pulp and the gas, with or without prior heating of the comminuted wood pulp, there being cooperation between the comminuting members in the apparatus comprising a cylindrical housing and a slotted outlet from the apparatus to discharge the reacted wood pulp without restraining the wood pulp while it is being comminuted, a portion of the bottom of said housing which provides said outlet being flattened to represent, in cross-section, the chord of a circle. This minimizes the production of compacted comminuted wood pulp.

3,725,194

TREATMENT OF ALKALINE PULP WITH AN ACIDIC MEDIUM FOLLOWED BY OXYGEN BLEACHING AND DELIGNIFICATION

Leon Smith, Petersfield; David W. Calvert, Westdene, both of Republic of South Africa; Andre Robert, Meylan; Andre Viallet, Grenoble, both of France, and Daniel R. Pauw, Ngodwana, Republic of South Africa, assignors to South African Pulp and Paper Industries, Limited and L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude

Continuation of Ser. No. 738,132, June 19, 1968, abandoned. This application July 9, 1971, Ser. No. 161,954
Int. Cl. D21c 9/10
U.S. Cl. 162—65 13 Claims

A method of delignifying and bleaching alkaline pulp which comprises the steps of pretreating the pulp with an acidic medium having a pH from 1.2 to 4.8, such as an aqueous sulphur dioxide solution or a mineral acid, and thereafter subjecting the pulp in an alkaline medium, preferably sodium hydroxide, to the action of oxygen gas at elevated temperature and pressure. Preferably, the pretreated pulp is subjected to the action of oxygen gas in the alkaline medium in the presence of a protector, such as magnesium carbonate or sodium silicate, which is operative to inhibit degradation of the physical strength properties of the pulp.

3,725,195

PAPERMAKING PROCESS COMPRISING THE INCORPORATION OF A POLYACRYLAMIDE MUCILAGINOUS MATERIAL

Fujio Suyama and Tokuo Yamamoto, Shizuoka, Kenichi Shimono and Hirosi Kuwahara, Fuji, Masao Ishii, Tokyo, and Ichiro Watanabe, Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., and Shizuoka-ken, Shizuoka-shi, Japan

No Drawing. Filed Aug. 10, 1970, Ser. No. 62,703
Claims priority, application Japan, Aug. 11, 1969, 44/62,932; Oct. 31, 1969, 44/86,852; Nov. 12, 1969, 44/90,007
Int. Cl. D21h 3/58
U.S. Cl. 162—168 6 Claims

A process is provided for the preparation of cellulosic paper sheets having a high degree of uniformity. In this process, an improvement has been discovered which comprises (1) sequestering the excess aluminum ion by the addition of a sequestering amount of a member selected from the group consisting of (i) a chelating agent and (ii) an acrylamide-based anionic polymer having a molecular weight of less than 1,000,000; and (2) after sequestering the excess free aluminum ion, then including in said fiber suspension 0.01–2% (based on dry fiber weight) of a polyacrylamide mucilaginous material of a molecular weight of more than 3,000,000 and a hydrolysis degree of 10 to 30%. The process allows the formation of paper sheets of an even texture and quality by obviating the problem of cellulose fiber slippage on the wire mesh and provides a uniform dispersion of the fibers in the vat.

3,725,196

FIBROUS BASE FELT CONTAINING CELLULOSIC FIBERS, 10% TO 50% ASBESTOS FIBERS, AND 1% TO 5% OF WATER SOLUBLE CATIONIC POLYACRYLIC RESIN AS A DRAINAGE AID

Donald C. Winters, Plainfield, N.J., assignor to Congoleum Industries, Inc., Kearny, N.J.

Filed April 8, 1970, Ser. No. 26,805
Int. Cl. D21h 5/18, 3/38
U.S. Cl. 162—145 3 Claims

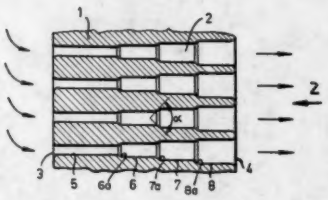
A fibrous base felt which includes cellulosic fibers, 10 percent to 50 percent asbestos fibers, and 1 percent to 5 percent of water soluble cationic polyacrylic resin is produced by separately forming a cellulosic fibrous slurry and an asbestos fibrous slurry, adding the polyacrylic resin to the asbestos fibrous slurry, mixing the slurries, and thereafter forming and drying the produced felt. Binders may be employed to saturate the felt subsequent to drying.

3,725,197

HEADBOX FOR A PAPERMAKING MACHINE CONTAINING MULTIPLE PARALLEL DUCTS

Hans Dahl, Ravensburg, and Anton Kurz, Langenargen, Germany, assignors to Escher Wyss GmbH, Ravensburg, Germany

Filed Aug. 11, 1970, Ser. No. 62,840
Claims priority, application Germany, Aug. 14, 1969, P 19 41 424.5; Oct. 22, 1969, P 19 53 086.0
Int. Cl. D21f 1/06
U.S. Cl. 162—343 8 Claims



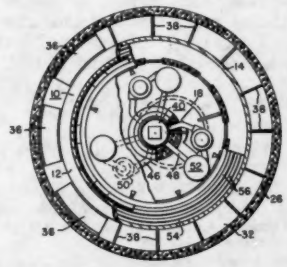
A headbox for a papermaking machine which includes a plate which extends over the width thereof and contains a plurality of parallel ducts, each of which widen in stepwise fashion with the opening angle between each successively larger duct portion being between 100° and 180°. The stock suspension feeds to the headbox plate directly from the supply conduit and is discharged from the parallel ducts to the headbox outlet by an unobstructed flow path.

3,725,198

NUCLEAR CONTAINMENT SYSTEM

Gunnar A. Harstead, Park Ridge, N.J., and John Locante, Monroeville, and James G. Russell, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1969, Ser. No. 813,136
Int. Cl. G21c 9/00
U.S. Cl. 176—37 4 Claims


38
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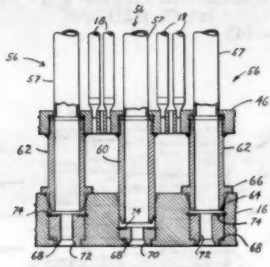
3,725,199
NUCLEAR REACTOR ORGANIZATION AND FUEL ASSEMBLY ARRANGEMENT

Gennaro V. Notari, Simsbury, and Royce J. Rickert, Bloomfield, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of application Ser. No. 631,090, Apr. 14, 1967. This application Apr. 9, 1969, Ser. No. 817,255
Int. Cl. G21c *15/22, 3/32, 3/14*
U.S. Cl. 176—61 **8 Claims**



A fuel assembly for a nuclear reactor cooled by a moderating fluid. The assembly has flow tubes that extend beyond the inlet of the assembly and provide positioning and support structure when the assembly is mounted in the reactor. Flow is regulated through the flow tubes by orifices upstream of these tubes.

3,725,200
PROCESS FOR FERMENTATIVE PRODUCTION OF YEAST CELLS

Kiyoshi Watanabe, Takasag, Yoshio Shimada, Hajime Kawaharada, and Kenji Suzuki, Kakogawa, and Fumio Tanaka, Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed July 7, 1970, Ser. No. 53,024
Claims priority, application Japan, Mar. 3, 1970, 45/18,562
Int. Cl. C12d *13/06*; C12b *1/00*
U.S. Cl. 195—28 R **12 Claims**

Process for producing yeast cells having high protein content in which a novel strain, *Candida novellus* is cultivated under aerobic condition in an aqueous nutrient medium containing n-paraffins or n-paraffin-containing hydrocarbons. The process ensures high yield of yeast cells, high protein content of the cells and increased cell productivity.

3,725,201
MANUFACTURE OF URIDINE-5-DIPHOSPHO-GLUCURONIC ACID

Tsunetake Sugimori and Yoji Tsukada, Kyoto, and Yasuhiko Tazuke, Osaka, Japan, assignors to Marukin Shoyu Company, Limited, Uchinomi-cho, Shozu-gun, Kagawaken, Japan

No Drawing. Filed Sept. 8, 1971, Ser. No. 178,781
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 N **7 Claims**

A process for manufacturing uridine-5'-diphosphoglucuronic acid which comprises cultivating a strain belonging to the genus Bacillus which is capable of producing uridine-5'-diphosphoglucose dehydrogenase to produce uridine-5'-diphosphoglucose dehydrogenase and reacting the resultant uridine-5'-diphosphoglucose dehydrogenase with uridine-5'-diphosphoglucose to produce uridine-5'-diphosphoglucuronic acid.

3,725,202
ENZYME TREATMENT

William Harold White, Fulton, Ill., and Robert George Dworschack, Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

No Drawing. Filed July 19, 1971, Ser. No. 164,058
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 R **10 Claims**

The disclosure is directed to a method of treating enzyme preparations containing glucoamylase and transglucosidase to substantially reduce the transglucosidase present therein with silver or mercuric ions. The treated enzyme preparations may be used to convert starch to dextrose.

3,725,203
BACTERIA IDENTIFICATION CULTURE MEDIUM

Walter M. Sellers, Jr., San Antonio, Tex., assignor to Media Services, Inc., San Antonio, Tex.

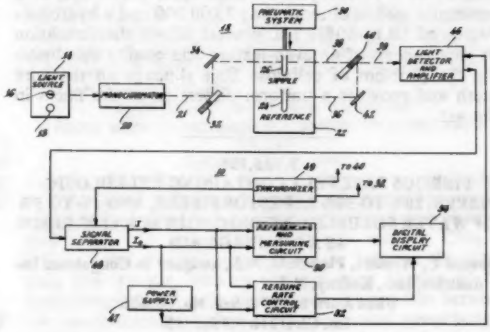
Filed Feb. 5, 1971, Ser. No. 113,095
Int. Cl. C12k *1/00*
U.S. Cl. 195—100 **15 Claims**

A culture medium which provides an environment for positive and nontransient identification of proteus and providence strains of enteric bacteria utilizes a combination of L-tryptophane with ferric ammonium citrate and brom cresol purple with the optional addition of L-phenylalanine in a slightly acid medium. The culture is also provided with a gelling agent such as agar in order to produce a slant and with nutrients for the bacteria. The combination of components may be incorporated into otherwise known culture media as well. When the combination is incorporated into slightly acid screening media such as lysine iron agar, a positive test for proteus and providence bacteria can be effected. When incorporated in other screening media such as Kligler iron agar or triple sugar iron agar which are slightly alkaline, this combination of ingredients improves the screening ability of these culture media although it does not provide a positive test for proteus and providence bacteria.

3,725,204
REACTION DETECTOR

Hamilton W. Marshall, Jr., Norwalk, and John R. Smeaton, Ridgefield, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 2, 1971, Ser. No. 167,947
Int. Cl. C12k *1/00*
U.S. Cl. 195—127 **7 Claims**



A reaction detector measures the rate of reaction in a substance undergoing a reaction, such as an enzyme-catalyzed chemical reaction, by measuring the rate of change of absorbance in the substance during the reac-

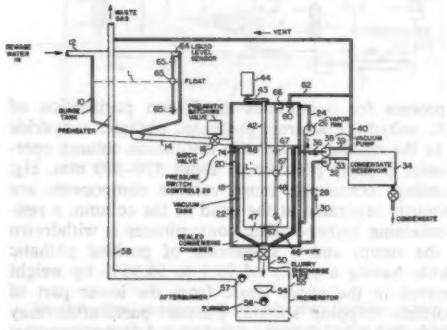
tion. This is accomplished by comparing the intensities of light penetrating through a reference and through the sample substance undergoing the reaction. The difference between the two intensities is measured and this difference is utilized to make the amplitude of a signal derived from the reference substantially equal to the amplitude of the signal derived from the sample substance. The reference signal is kept constant to establish a reference level whereas the sample signal is measured a predetermined time later and such a measurement provides directly the reaction rate. This reaction rate is then automatically transformed into units specifying the concentration of enzymes in the sample substance.

3,725,205

APPARATUS FOR CLEANING SEWAGE WATER

Helge K. Heen, Avon, N.Y., assignor to Adaks Products Incorporated

Filed May 12, 1970, Ser. No. 36,637
Int. Cl. B01d *1/00, 3/00, 3/42*
U.S. Cl. 202—181 **12 Claims**



Sewage water is fed to a surge tank, and from there, periodically and in predetermined quantities, through a batching valve to a sealed evaporator tank, which is surrounded adjacent its lower end by a condensing chamber. When the level of the liquid in the evaporator drops to a predetermined low limit, sensing means opens the batching valve momentarily to fill the tank, thereby starting a vacuum pump which reduces the pressure in the tank and chamber approximately to the saturated vapor pressure in the tank. A vapor fan then pumps vapor from the tank to the chamber, where the vapor condenses and transfers heat to the remaining sewage water in the tank. Periodically the slurry in the tank is automatically discharged and incinerated.

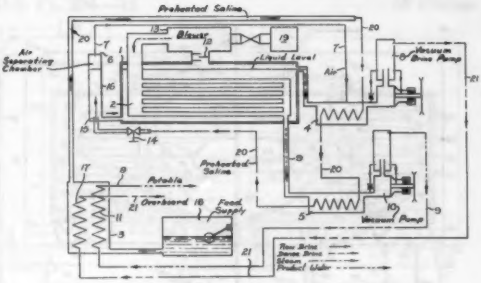
3,725,206

DESALINATION PLANT

Norman Leslie Foley, Clovercrest, Modbury, South Australia, Australia, assignor to Auscoteng Pty. Ltd., Wayville, South Australia, Australia

Filed Sept. 9, 1970, Ser. No. 70,816
Claims priority, application Australia, Sept. 11, 1969, 60,784/69
Int. Cl. B01d *1/00, 3/00, 3/10, 3/14, 3/42;* **C02b** *1/04*
U.S. Cl. 202—205 **3 Claims**

A desalination plant to distill water from sea water at ambient temperature without the addition of heat, wherein a condenser is formed in an evaporator in heat exchange relation therewith. A blower evacuates the evaporator and transfers steam to the condenser, and two combined liquid-vacuum pumps are provided, one to remove dense brine and air from the evaporator, the other to remove condensate and air from the condenser.



A high vacuum is thus produced in the evaporator sufficient to cause boiling at ambient temperature.

3,725,207

DISTILLATION OF A HALOALKYL-CYANIDE WITH A NITRILE

Richard L. Golden, Oradell, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed May 27, 1970, Ser. No. 41,091
Int. Cl. B01d *3/34;* **C07c** *121/06*
U.S. Cl. 203—6 **4 Claims**

Alkylene nitriles having the formula X—CH_2—CHR—CN may be purified by distillation by maintaining a concentration of 1 to 5 mol percent of CH_2=CRCN in the distillation zone during the distillation. R may be hydrogen or a lower alkyl and X a chloro-, iodo- or bromo-group.

3,725,208

PROCESS FOR PURIFICATION OF ACRYLIC ACID FROM ALDEHYDES BY DISTILLATION WITH A REAGENT

Shiro Maezawa, Hiroshi Yoshikawa, Kenji Sakamoto, and Jun Fujii, Takasaki, and Makoto Hashimoto, Tokyo, Japan, assignors to Nippon Kayaku Company, Ltd., Tokyo, Japan

No Drawing. Filed Aug. 20, 1971, Ser. No. 173,646
Int. Cl. C07c *57/04*
U.S. Cl. 203—8 **9 Claims**

A process for the removal of small amounts of aldehyde impurities from acrylic acid comprises adding to the acrylic acid minor amounts of a compound selected from the group consisting of sulfuric acid, hydrazine, phenylhydrazine, aniline, monoethanolamine, ethylene diamine and glycine, and subjecting the acrylic acid mixture to distillation.

3,725,209

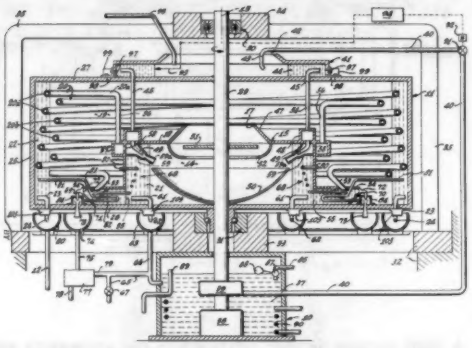
CENTRIFUGAL DISTILLATION SYSTEM

Faust Rosa, Northridge, Calif. (4977 Battery Lane, Apt. 910, Bethesda, Md. 20014)

Filed Aug. 11, 1970, Ser. No. 62,814
Int. Cl. B01d *3/10*
U.S. Cl. 203—24 **35 Claims**

Distillation of fresh water from seawater by introducing the seawater into an evaporating zone defined in the central portion of a sealed rotary drum to vaporize water into a vapor space within the drum, and confining unevaporated liquid in the evaporating zone while centrifugally compressing vapor in a condensing zone around the evaporating zone and condensing the vapor on heat exchange coils with cooler liquid circulated therethrough. In a one-stage embodiment, collected liquid from the evap-

orating zone is circulated through the coils, while modified embodiments use similar rotary drums as heat pumps



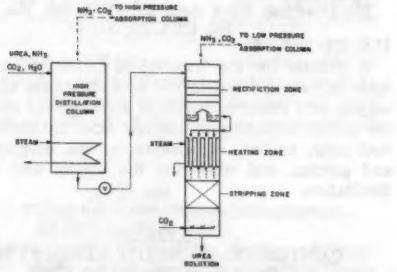
for preparing liquid for distillation in at least one preliminary stage.

3,725,210

METHOD OF REMOVING UNREACTED MATERIALS REMAINING IN UREA SYNTHESIS EFFLUENT BY PLURAL STAGE DISTILLATION AND CO_2 STRIPPING

Eiji Otsuka and Kazumichi Kanai, Fujisawa, Shigeru Inoue, Kamakura, and Novuyoshi Hashimoto, Yokohama, Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed Aug. 18, 1970, Ser. No. 64,805
Claims priority, application Japan, Aug. 30, 1969, 44/68,311
Int. Cl. C07c *127/04*
U.S. Cl. 203—42 **10 Claims**



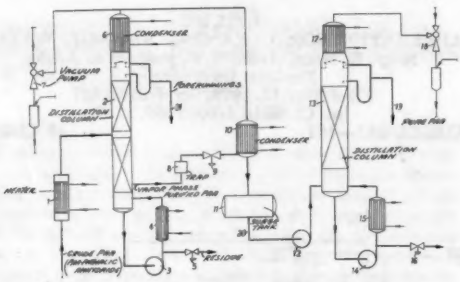
Urea synthesis effluent from which the major portion of unreacted carbon dioxide and ammonia have been removed, is completely stripped of the remaining unreacted materials by passing the effluent through a column having a rectification zone maintained at a gauge pressure of 0 to 5 kg./cm.^{2} and a head temperature of 60° to 120° C., a heating zone maintained at 100° to 140° C. and a stripping zone wherein carbon dioxide is introduced at the rate of 0.01 to 0.2 mol per mol of urea contained in the effluent, whereby the unreacted materials are completely removed from the urea synthesis effluent.

3,725,211

CONTINUOUS DISTILLATION OF PHTHALIC ANHYDRIDE WITH VAPOR SIDE STREAM RECOVERY

Hubert Gehrken, Welden, Gerd Helms, Junkersdord, Gerhard Keunecke, Geyen, and Herbert Krimphove, Cologne-Muengersdorf, Germany, assignors to Chemiebau Dr. A. Zieren GmbH & Co. KG, Cologne-Muengersdorf, Germany

Continuation-in-part of application Ser. No. 843,871, Apr. 1, 1969. This application Mar. 1, 1972, Ser. No. 231,015
Int. Cl. B01d *3/14*; C07c *63/18*
U.S. Cl. 203—74 **12 Claims**



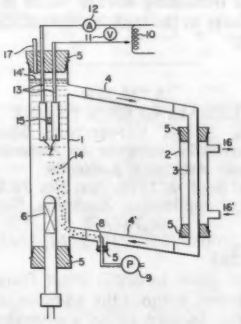
A process for continuous distillation purification of phthalic anhydride wherein preheated phthalic anhydride is fed to the middle section of a distillation column operated under a sump pressure of about 550–800 mm. Hg; forerunnings containing more volatile components are continuously separated at the head of the column; a residue containing higher-boiling contaminates is withdrawn from the sump; and a sidestream of purified phthalic anhydride having a purity of 99.1 to 99.95% by weight is removed in the vapor phase from the lower part of the column stripping section. Further purification may be obtained by passing the purified sidestream product into a small vacuum distillation column.

3,725,212

METHOD FOR TESTING RADIATOR-TUBE-CLOGGING PROPERTY OF ANTIFREEZING COOLANTS

Susumu Kawamoto and Hisao Suzuki, Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1971, Ser. No. 121,055
Claims priority, application Japan, Mar. 7, 1970, 45/19,574
Int. Cl. G01n *27/00*
U.S. Cl. 204—1 T **5 Claims**



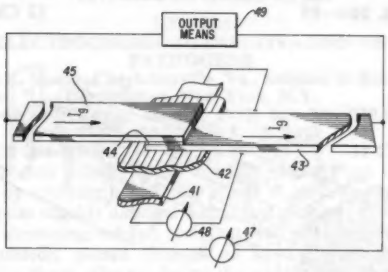
A method of rapidly testing radiator tube clogging properties of antifreezing coolants for automotive en-

gines in which the coolant to be tested is circulated through a heating zone and a cooling zone. Metal pieces are inserted in the coolant in the heating zone and a source of electric current is connected to the metal pieces for electrolyzing the same and the amount of material deposited in the cooling zone is measured.

3,725,213
METHOD OF FORMING SUPERCONDUCTIVE BARRIER DEVICES

Joe T. Pierce, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 677,327, Oct. 23, 1967. This application April 13, 1970, Ser. No. 32,491
Int. Cl. C23b *5/48*; C23f *17/00*; B44d *1/18*
U.S. Cl. 204—15 **4 Claims**



Disclosed are superconductive barrier devices, comprising a gate region with a control line adjacent to the gate, which can perform cryogenic switching and logic functions. According to the various embodiments, the gate region may comprise a relatively thin superconductive layer separated by a very thin insulative layer from a relatively thick superconductive layer, a discontinuous superconductive layer separated by a thin insulative layer from a thick superconductive layer, a pair of superconductors separated by an insulating barrier thin enough to permit electron pair tunneling therethrough, or a granular superconductor wherein the grains are separated by an insulating barrier thin enough to permit electron pair tunneling therethrough. Also disclosed are superconductive barrier devices comprising granular superconductors which may be employed as millimeter or submillimeter radiation generators or detectors.

3,725,214
CHROMIUM PLATING MEDIUM FOR A PORTABLE PLATING DEVICE

John Edwin Bride, Mentor, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

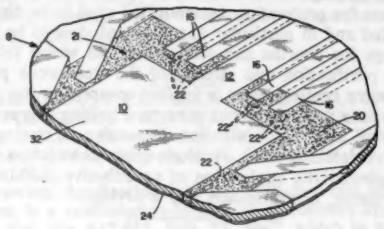
Filed Feb. 19, 1971, Ser. No. 117,126
Int. Cl. C23b *5/48*, *5/06*; B23p *1/02*
U.S. Cl. 204—15 **4 Claims**

Desirable electrodeposition of bright chromium plate can be made onto a substrate from a portable plating device having an absorbent mass containing chromic plating medium. The medium contains a complex, water-soluble chromic compound for plating, which compound contains carboxylic acid constituents and halogen constituents. A uniform, bright chromium plate can be readily obtained on the substrate at a desirable current density that avoids the problems accompanying portable plating at elevated temperature.

3,725,215
FILLER MASKING OF SMALL APERTURES

Gary Uchytil, Campbell, Calif., assignor to Micro Science Associates, Mountain View, Calif.

Filed Mar. 17, 1971, Ser. No. 125,098
Int. Cl. C23b *5/48*; G03c *5/00*; B44d *1/18*
U.S. Cl. 204—15 **10 Claims**



Relatively small apertures or passages in a sheet are masked to prevent the plating of the apertures during the electroplating of remaining portions of the sheet by filling the apertures with a readily deformable, photo-hardenable material. A facing is applied to one side of the sheet to retain the deformable material in the apertures until the material has been subjected to radiant energy and thereby hardened. Remaining surface portions of the sheet are then conventionally electroplated and thereafter the sheet is immersed in a dissolving agent to strip the photo-hardenable material and bare the apertures for subsequent use of the sheet.

3,725,216
PLASTIC MOLDING COMPOSITION AND METHOD OF PREPARATION

Michael Ladney, Jr., Grosse Pointe Shores, Mich. (18125 E. Ten Mile Road, East Detroit, Mich. 48021)

No Drawing. Filed Sept. 27, 1971, Ser. No. 184,214
Int. Cl. C23b *5/62*
U.S. Cl. 204—30 **1 Claim**

ABS plastic molding pellets containing a small amount of iso-octly stearate which imparts to the molded part the ability to provide an excellent bond for an electrolytically deposited metal plating.

3,725,217
PLATING TITANIUM AND ZIRCONIUM AND THEIR ALLOYS WITH NICKEL, CHROMIUM AND OTHER HEAVY METALS

Derick S. Hartshorn, Jr., Larchmont, N.Y., assignor to Ionitech Laboratories Incorporated, Chappaqua, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 843,185, July 18, 1969. This application May 15, 1970, Ser. No. 37,843
Int. Cl. C23f *1/00*, *17/00*
U.S. Cl. 204—32 R **19 Claims**

A method of plating upon a workpiece of titanium, zirconium, or their alloys with heavy metals which comprises cleaning and lightly pickling without excessive etching or roughening of the surface, which will maintain close tolerance dimensions and surface smoothness in the area of the workpiece to be plated, deoxidizing and coating said area with a conversion coating by immersion in a solution of fluorosilicate or fluoroborate, of which the alkali metal, ammonium, alkaline earth, aluminum and magnesium fluoroborates and fluorosilicates are notable, substantially or wholly removing non-adherent surface layer of conversion film by immersion in an acid, and plating the coated area electrolytically as the cathode in a heavy metal electrolytic plating solution to form a strongly adherent metallic bond. A fluoro film of unknown constitution, which is sometimes so thin as to be invisible even under the electron microscope, joins the chromium or nickel plate firmly to the titanium or zirconium body.

3,725,218

PROCESS FOR PRETREATING DECARBONIZED STEEL TO BE DIRECTLY ENAMELLED

Christian Friedel, Suhl, and Manfred Faethe, Dresden, Germany, assignors to Veb Elektrogeratewerk Suhl, Suhl, Germany

No Drawing. Filed Feb. 11, 1971, Ser. No. 114,705
Int. Cl. C23b *1/04*; C23f *17/00*
U.S. Cl. 204—34 8 Claims

Process for pretreating decarbonized steel to be directly enamelled and in particular flat pieces of steel to be used as linings for hearths and refrigerators in which following the purification and etching of the steel work piece, an adhesive coating layer is applied comprising the steps of subjecting such steel work piece to a boiling degreasing, then to an electrolytic alkaline degreasing, a rinsing, an electrolytic etching using a sulfuric acid electrolyte, a rinsing an electrolytic application of an adhesive metal coating, a rinsing, neutralization and a drying.

3,725,219

PROCESS FOR PLATING ARTICLES WITH SILVER-PALLADIUM ALLOYS

Henry J. Wesoloski, Milton, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed May 4, 1965, Ser. No. 453,009
Int. Cl. C23b *5/52*
U.S. Cl. 204—37 R 1 Claim

A process for plating an article with a silver-palladium alloy comprises the steps of: providing the article with a conventional silver strike; electroplating the article in a silver cyanide solution at a current density of about 10 amperes per square foot for about 20 minutes; electroplating the article in an agitating palladium chloride and ammonium chloride acidic solution at a current density of about 4 amperes per square foot for about 8 hours; and heating the article at a temperature of about 300 to 400° C. for about 8 hours to alloy the silver and palladium thereon.

3,725,220

ELECTRODEPOSITION OF COPPER FROM ACIDIC BATHS

Richard B. Kessler, Jericho, and Fred I. Nobel, Roslyn, both of N.Y., assignors to Lea-Ronal, Inc., Freeport, N.Y.

Filed April 27, 1972, Ser. No. 248,160
Int. Cl. C23b *5/20, 5/46*
U.S. Cl. 204—52 R 13 Claims

An acid copper plating bath which contains a copper metal salt and a minor amount of a sulfoniumalkanesulfonate or sulfoniumalkanecarboxylate as a brightening agent. Illustrative sulfonium compounds are N-cyclohexyl-2-benzothiazol sulfonium-1-propanesulfonate, bis (dimethylthiocarbamyl) sulfonium-1-propanesulfonate, and bis (dimethylthiocarbamyl) sulfonium-1-propanecarboxylate. Preferred amounts of the sulfonium compounds range from about 0.001 to 1.0 grams per liter. The use of such acid copper plating baths in the electrodeposition of copper metal is also disclosed.

3,725,221

RECOVERY OF NIOBIUM AND TANTALUM

John M. Gomes, 1650 Rayburn Drive 89503; Kenji Uchida, 1341 Hillside Drive 89502; and Morton M. Wong, 2281 Riviera St. 89502, all of Reno, Nev.

No Drawing. Filed Jan. 26, 1972, Ser. No. 221,092
Int. Cl. B01k *1/00*
U.S. Cl. 204—61 5 Claims

Niobium and tantalum are recovered as phosphides from a crude oxide or mineral feed material by selective electrodeposition from a fused salt bath comprising the feed material, an alkali metal phosphate, an alkali metal halide and an alkali metal borate or boric oxide. Electrolysis at a potential of 2.5 volts or less results in deposition of niobium phosphide essentially free of tantalum, with subsequent electrolysis at 4.0 volts or greater resulting in deposition of tantalum phosphide.

3,725,222

PRODUCTION OF ALUMINUM

Allen S. Russell, New Kensington; Lester L. Knapp, Maryville, and Warren E. Haupin, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 26, 1971, Ser. No. 192,653
Int. Cl. C22d *3/12*
U.S. Cl. 204—67 17 Claims

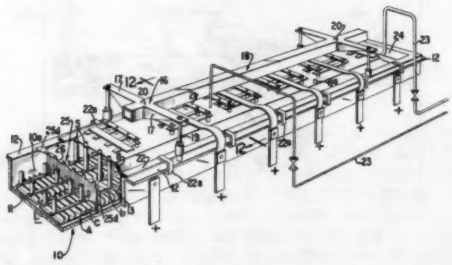
Production of aluminum by continuous electrolysis of aluminum chloride in molten electrolyte of controlled oxide content.

3,725,223

BAFFLES FOR DIMENSIONALLY STABLE METAL ANODES AND METHODS OF USING SAME

Vittorio de Nora, Nassau, Bahama Islands, and Giovanni Trisoglio, Como, Italy, assignors to Electronor Corporation, Panama City, Panama

Filed Mar. 2, 1971, Ser. No. 120,247
Claims priority, application Italy, Jan. 18, 1971, 19,473/71
Int. Cl. C01d *1/08*; C22d *1/04*
U.S. Cl. 204—99 12 Claims



Describes baffles for use with dimensionally stable metal anodes in flowing mercury cathode electrolysis cells to control the flow of the electrolyte through the electrolysis gap and upwardly through the openings in the anode working surfaces to improve the operation of the cells, and the method of controlling the flow of the electrolyte through the cells by the use of said baffles or similar flow controlling devices.

3,725,224

COMPOSITION FOR ELECTROLYTIC DESCALING OF TITANIUM AND ITS ALLOYS

Earl W. Kendall, Bonita, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation-in-part of Ser. No. 816,460, Feb. 28, 1969, abandoned. This application June 30, 1971, Ser. No. 158,611
Int. Cl. C23g *1/02*; C23b *1/00*; C09k *3/00*
U.S. Cl. 204—141.5 9 Claims

A non-aqueous electrolytic bath for descaling titanium and its alloys utilizes a hydrofluoric acid bearing compound such as 48 – 50 percent hydrofluoric acid to provide the attack ion in a glacial acetic acid carrier. A buffering agent such as sulfuric acid, acetic anhydride or sulfur trioxide acts as a dehydrating agent picking up water from the hydrofluoric acid to deionize the same and prevent attack on the titanium.

3,725,225

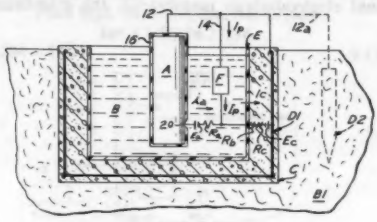
CATHODIC PROTECTION METHOD

Leon P. Sudrabin, Berkeley Heights, and Paul Kaiser, Union, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 30, 1971, Ser. No. 129,496
Int. Cl. C23f *13/00*
U.S. Cl. 204—147 10 Claims

Cathodic protection system for metal structures at least partially immersed in a corroding electrolyte and being

connected to a second metal structure by a continuous conductive path. An electrically resistant diaphragm is interposed in the electrolyte between the two structures. Cathodic protection current is then applied to the first metal structure by an anode disposed within the electrolyte between the first metal structure and the diaphragm.



3,725,226
ELECTROCHEMICAL INACTIVATION OF PATHOGENS

Glenn E. Stoner, Charlottesville, Va., assignor to Research Corporation, New York, N.Y.

No Drawing. Filed Mar. 1, 1972, Ser. No. 230,953
Int. Cl. C02b *1/82;* **C02c** *5/12;* **B01k** *1/00*
U.S. Cl. 204—149 **11 Claims**

Pathogens existing in an aqueous medium are inactivated by applying a potential across at least one pair of electrodes suitably disposed within said medium, by means of an alternating voltage, such that each of said electrodes is repeatedly passed through an anodic phase and a cathodic phase, wherein during the anodic phase the peak voltage is less than that at which vigorous electrolytic oxygen is generated, and during the cathodic phase, the peak voltage is greater than that at which electrolytic hydrogen is generated, such that during said anodic phase, pathogens contained within said aqueous medium are inactivated at at least one of said electrodes, and during said cathodic phase, said inactivated pathogens are defouled from said electrode.

3,725,227
PROCESS FOR THE MANUFACTURE OF 2-CHLORETHANEPHOSPHONIC ACID DICHLORIDE

Hans-Jerg Kleiner, Bad Soden, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 26, 1971, Ser. No. 128,537
Claims priority, application Germany, Mar. 28, 1970, P 20 15 163.7
Int. Cl. B01j *1/10;* **C07f** *9/42*
U.S. Cl. 204—158 HA **10 Claims**

Preparation of 2-chlorethanephosphonic acid dichloride by the reaction of ethanephosphonic acid dichloride with a chlorinating agent.

3,725,228
HIGH ENERGY CURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Application June 23, 1970, Ser. No. 49,191, which is a continuation-in-part of abandoned application Ser. No. 617,801, Feb. 23, 1967, which in turn is a continuation-in-part of abandoned application Ser. No. 567,841, July 26, 1966. Divided and this application June 25, 1971, Ser. No. 156,975
Int. Cl. C08c *11/54;* **C08d** *1/00;* **C08f** *1/16*
U.S. Cl. 204—159.14 **17 Claims**

The invention disclosed is for a new high energy curable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain backbone of the molecule, and a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule. The high energy curable liquid polymer composition upon curing in the presence of high energy irradiation forms odorless, solid, elastomeric products which may serve as sealants, coatings, adhesives, and molded articles.

3,725,229
HIGH ENERGY CURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

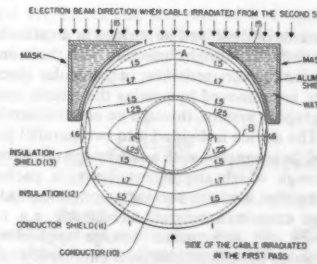
No Drawing. Application June 23, 1970, Ser. No. 49,191, which is a continuation-in-part of abandoned application Ser. No. 617,801, Feb. 23, 1967, which in turn is a continuation-in-part of abandoned application Ser. No. 567,841, July 26, 1966. Divided and this application June 25, 1971, Ser. No. 156,950
Int. Cl. C08c *11/54;* **C08d** *1/00;* **C08f** *1/16*
U.S. Cl. 204—159.14 **17 Claims**

The invention disclosed is for a new high energy curable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain backbone of the molecule, and a polythiol component having a molecule containing a mulitplicity of pendant or terminally positioned —SH functional groups per average molecule. The high energy curable liquid polymer composition upon curing in the presence of high energy irradiation forms odorless, solid, elastomeric products which may serve as sealants, coatings, adhesives, and molded articles.

3,725,230
INSULATED ELECTRICAL CABLES AND METHOD OF MAKING THEM

George Bahder, Edison, N.J., Oscar G. Garner, Riverside, Conn., and George S. Eager, Jr., Upper Montclair, N.J., assignors to General Cable Corporation, New York, N.Y.

Filed Mar. 29, 1971, Ser. No. 128,809
Int. Cl. B01j *1/10*
U.S. Cl. 204—159.2 **5 Claims**



This application discloses insulated electrical cables and method of making them. The cables consist of metallic conductors, stranded or solid, a semi-conducting shield over the conductor, a comparatively heavy wall of insulation and another layer of semi-conducting shield which, if used in sufficient thickness, may serve both as a shield and an outer protective jacket. The cables are irradiated in a particular controlled manner to improve desired physical characteristics while preserving desired insulating characteristics. The invention is particularly applicable to high voltage cables rated 5 to 70 kv. or above.

3,725,231
PHOTOSENSITIVE DIACETONE ACRYLAMIDE RESINS

Richard William Jahnke, Mentor on the Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

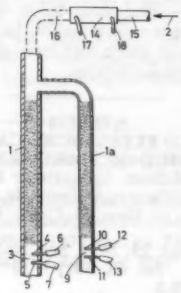
No Drawing. Filed Aug. 20, 1971, Ser. No. 173,664
Int. Cl. B01j *1/00*; C08d *1/10*
U.S. Cl. 204—159.14 7 Claims

Diacetone acrylamide and analogous substituted acrylamides react with aldehydes containing conjugate unsaturation with respect to the carbonyl group, in the presence of an alkaline reagent, to yield monomeric compounds which are photosensitive and which form photosensitive polymers. The latter can also be prepared by reacting said aldehydes with a diacetone acrylamide polymer while gradually adding said alkaline reagent. The polymers crosslink on exposure to visible or (preferably) ultraviolet radiation and are useful in the preparation of lithographic printing plates, photoresists, etc.

3,725,232
DETECTION METHOD AND APPARATUS FOR CHROMATOGRAPHY

Victor Pretorious, and Hans Helmut Hahn, both of Pretoria, Republic of South Africa

Division of Ser. No. 583,788, Oct. 3, 1966, Pat. No. 3,594,294.
This application Feb. 23, 1971, Ser. No. 118,128
Int. Cl. B01k *5/00*
U.S. Cl. 204—180 G 10 Claims



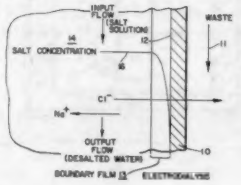
Small amounts of dissolved impurities in an eluent for chromatography and which might interfere with the monitoring of a chromatogram by very sensitive, in particular electrochemical detectors, are removed by passing the eluent, on its way to a chromatographic system, through an electrochemical cleaning device. The device is divided into two parallel passages by a porous wall impregnated with a salt bridge medium. The one passage through which the eluent flows, is packed with a porous conductive medium serving as one electrode and the other passage contains a reference electrode, e.g. calomel or silver chloride. An appropriate voltage applied across the electrodes causes the electrochemical elimination of the interfering impurities.

3,725,233
ELECTRO-OSMOSIS SYSTEM

Jack D. Smith, Boston, Mass., assignor to American Bioculture, Inc.

Original application June 5, 1969, Ser. No. 830,688, now Patent No. 3,657,106. Divided and this application Apr. 14, 1972, Ser. No. 244,138
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 P 2 Claims

A desalting system making use of electro-osmosis is similar to conventional electrodialysis arrangements in that the input solution is passed between a pair of membranes one of which is anion permeable and the other cation permeable, an applied electric field causing the anions and cations to leave the solution by migrating through the respective membranes. However, unlike conventional electrodialysis membranes, the membranes are



also relatively permeable to water. The resulting flow of water toward and through the membranes materially increases the rate at which ions are transported to the membranes and correspondingly increases the rate at which ions are removed from the input solution.

3,725,234
PARTIAL INSULATION OF AN ELECTRO-DEPOSITION TANK

Frederick M. Loop, North Olmsted, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

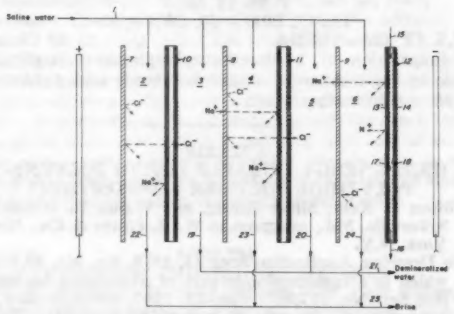
Filed Apr. 28, 1971, Ser. No. 138,215
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 6 Claims

In a continuous electrodeposition process where the article enters the electrodeposition bath in a power-off configuration, it has been found that surface irregularities occur on an article when that article is introduced power-off into the electrodepositable composition while the preceding article is still being coated and is in a power-on condition. This problem is solved by insulating that portion of the electrodeposition tank adjacent to and to the rear of the point of entry of the article.

3,725,235
DYNAMICALLY FORMED ELECTRODIALYSIS MEMBRANES

Milton S. Mintz, McLean, Va., assignor to the United States of America as represented by the Secretary of the Interior

Filed Mar. 23, 1971, Ser. No. 127,100
Int. Cl. B01d *13/02*; B01k *5/00*
U.S. Cl. 204—180 P 18 Claims



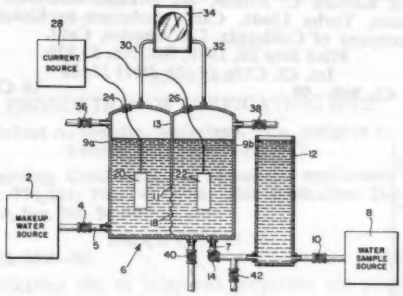
Electrodialysis membranes are formed in situ by contacting an aqueous suspension of an ion exchange resin with a support material prior to application of an electrical potential across the separation unit.

3,725,236

ELECTROCHEMICAL OXYGEN DEMAND APPARATUS

Justin O. Johnson, Jr., Levittown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 24, 1970, Ser. No. 75,438
Int. Cl. G01n 27/46
U.S. Cl. 204—195 R 9 Claims



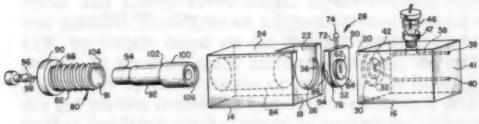
A non-biological method of exhaustive electrochemical oxidation utilizing an apparatus for forming oxygen in an aqueous sample through exhaustive electrolysis by a current flow between a pair of electrodes to oxidize the organic material in the sample in combination with an electrochemical oxidation of the organic material at an electrode immersed in the sample. The separate products of the electrolysis at the respective electrodes are collected, and the partial pressures thereof are measured by a differential pressure measuring means to provide an indication of the oxygen demand when correlated with an electrolysis of a reference fluid sample.

3,725,237

APPARATUS FOR MEASURING ION ACTIVITY OF SOLUTIONS

George Matsuyama, Fullerton, and Grover F. Lindell, Anaheim, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 26, 1970, Ser. No. 83,884
Int. Cl. G01n 27/46
U.S. Cl. 204—195 L 10 Claims



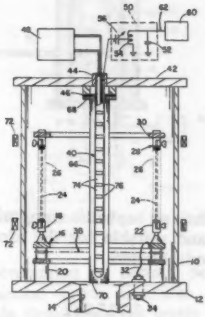
An apparatus for measuring the ion activity of a solution in which the ion sensitive barrier of the apparatus comprises a unitary membrane assembly in which an organic sensing solution is held between two hydrophilic membranes, preferably cellophane and cellulose acetate, respectively. Means are provided for replaceably mounting the membrane assembly in a sample flow cell which permits sample solution to flow past the cellophane membrane of the assembly and an electrolyte solution to contact the cellulose acetate membrane.

3,725,238

TARGET ELEMENT

Irwin W. Fischbein, Canton, Ben H. Alexander, Brookline, and Aiyaswami S. Sastri, Malden, Mass., assignors to The Gillette Company, Boston, Mass.

Continuation-in-part of application Ser. No. 865,634, Oct. 13, 1969, which is a continuation-in-part of application Ser. No. 845,142, July 28, 1969. This application June 19, 1970, Ser. No. 47,664
Int. Cl. C23c 15/00
U.S. Cl. 204—298 5 Claims



A target element for use in an RF sputtering system for forming a thin film metal alloy on the surface of a substrate. The target element is in the form of an elongated rod and its exposed surface is composed of alternating bands of first and second metals in metallurgically separate form from one another.

3,725,239

HYDROGENATION CATALYST AND PROCESS

Thomas E. Kiovsky, El Sobrante, and Milton M. Wald, Walnut Creek, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Original application May 15, 1970, Ser. No. 37,912. Divided and this application Nov. 15, 1971, Ser. No. 198,954
Int. Cl. C10g 1/06
U.S. Cl. 208—10 1 Claim

A catalyst for increasing the rate of hydrogenation reactions including a complex salt of the chloride, bromide or iodide of zinc, tin, antimony, bismuth, cadmium, gallium, mercury or arsenic, and the corresponding ammonium halide.

3,725,240

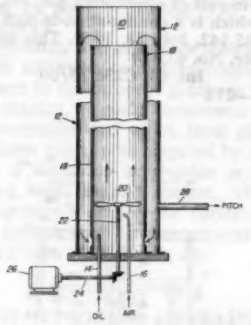
PROCESS FOR PRODUCING ELECTRODE BINDER ASPHALT

Lester A. H. Baum, Cherry Hill, N.J., assignor to Mobil Oil Corporation

Continuation-in-part of application Ser. No. 57,777, July 23, 1970, which is a continuation-in-part of application Ser. No. 777,157, Nov. 19, 1968, and a continuation-in-part of application Ser. No. 57,825, July 23, 1970, which is a continuation-in-part of said application Ser. No. 777,157, all now abandoned. This application May 13, 1971, Ser. No. 143,063
Int. Cl. C10c 3/04; C10g 37/04
U.S. Cl. 208—76 8 Claims

Asphaltic compositions suitable for use as binders for carbon electrodes can be prepared by a continuous process of polymerization from a feed stock comprising a high boiling oil portion of the product obtained from catalytic cracking of petroleum gas oils, provided that portion (cycle stock) is further cracked in the absence of catalyst and fractionated to remove light ends. A suitable polymerization is conducted in the presence of air at a rate

from about 6 to about 30 standard cubic feet of air per minute per barrel of liquid, at a temperature from about 750° F. to about 850° F., and for a period not exceeding



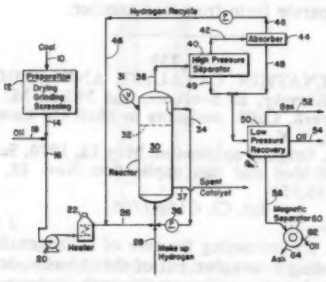
one hour to produce an asphaltic composition of increased specific gravity and suitable for the aforementioned use as carbon electrode binders.

3,725,241

SOLIDS REMOVAL FROM HYDROGENATED COAL LIQUIDS

Michael C. Chervenak, Pennington, N.J., assignor to Hydrocarbon Research, Inc., New York, N.Y.

Filed Dec. 9, 1971, Ser. No. 206,439
Int. Cl. C10g *1/00, 1/06*
U.S. Cl. 208—10 **7 Claims**



Better than fifty percent of the ash and associated solids from a coal-derived oil, such as a hydrogenated coal product, are removed by magnetic separation. The ash and associated solids have been rendered magnetically susceptible by prior hydrogenation treatment.

3,725,242

CRACKING HYDROCARBON RESIDUA TO COKE AND AROMATIC GAS OIL

Glen P. Hamner, Baton Rouge, and Ralph B. Mason, Denham Springs, La., assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 840,814, July 10, 1969. This application Jan. 13, 1971, Ser. No. 106,278
Int. Cl. C10g *37/06*
U.S. Cl. 208—46 **15 Claims**

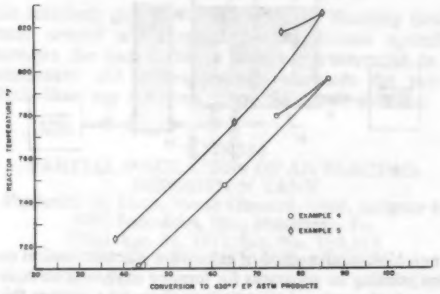
Coke and a gas oil fraction boiling between 400 and 1050° F. are produced by hydrodepolymerizing a hydrocarbon residua. In particular a steam cracked tar having a boiling point above 650° F., with a substantial amount of the tar having a boiling point above 1050° F., is mixed in specific proportions with a gas oil having a boiling point between 400 and 650° F. and an acyclic hydrocarbon modifier in a reaction zone operating at a temperature between 775 and 900° F. and at a pressure between 50 and 1000 p.s.i.g. to maximize the amount of coke produced.

3,725,243

HYDROCARBON CONVERSION CATALYSTS COMPRISING PHOSPHORUS AND ALUMINOSILICATES

Robert H. Hass, Fullerton, Grant A. Mickelson, Yorba Linda, William J. Baral, Long Beach, Cloyd P. Reeg and Edward C. Attane, Jr., Orange, and Darryl L. Jones, Yorba Linda, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed July 10, 1970, Ser. No. 53,820
Int. Cl. C10g *13/02;* **B01j** *11/82*
U.S. Cl. 208—59 **10 Claims**



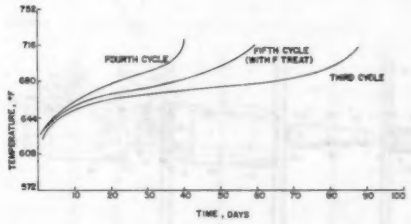
Hydrocarbon conversion catalysts having markedly improved characteristics are prepared from intimate admixtures of foraminous alumina-containing refractory oxides and ion exchangeable crystalline aluminosilicate zeolites by impregnation with a strong acidic solution containing Group VIII and Group VI metal compounds and an acid of phosphorus at a pH below 3, to substantially destroy the zeolite crystallinity.

3,725,244

HYDROCRACKING PROCESS WITH FLUORINE TREAT TO AVOID CONDENSED POLYAROMATICS

Hans U. Schutt, Lafayette, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 13, 1971, Ser. No. 188,408
Int. Cl. C10g *9/16, 13/06;* **B01j** *11/80*
U.S. Cl. 208—59 **8 Claims**



A two-stage hydrocracking process employing recycle of high boiling, second stage product to second stage feed and a second stage catalyst containing an iron group hydrogenative metal supported on an amorphous silica-alumina-fluorine acid-acting base is improved to avoid formation of polyaromatic compounds in the high boiling product by

(a) first discontinuing the flow of hydrocarbon feed to the second-stage;

(b) then contacting the second stage catalyst with oxygen;
(c) contacting the oxidized second stage catalyst with a sulfiding compound at conditions to convert the iron group metal component to a sulfide form;
(d) contacting the second stage catalyst with from about 0.001% to about 0.2% wt. of catalyst of fluorine in the form of a vapor phase fluoriding compound at a temperature of from 350° to 1100° F.; and
(e) re-establishing the flow of hydrocarbon feed to the second-stage.

3,725,245

PRODUCTION OF LUBRICATING OILS

Robert A. Woodle, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 774,481, Nov. 8, 1968. This application Dec. 2, 1970, Ser. No. 94,547

Int. Cl. C10g *41/00*

U.S. Cl. 208—86 9 Claims

Lubricating oils of improved properties are prepared by topping a crude under atmospheric pressure, deasphalting the reduced crude, hydrogenating the deasphalted oil and distilling the hydrogenation product under reduced pressure to recover lube oil distillates. The vacuum residuum may also be solvent deasphalted to produce additional heavier grade lubricants.

3,725,246

HYDROGEN PRODUCTION AND UTILIZATION

Ronald A. Kmecak and Stephen M. Kovach, Ashland, Ky., assignors to Ashland Oil, Inc., Houston, Tex.

No Drawing. Continuation of abandoned application Ser. No. 769,727, Oct. 22, 1968. This application Nov. 23, 1970, Ser. No. 92,243

Int. Cl. C01b *1/18*

U.S. Cl. 208—100 5 Claims

A process for the production of hydrogen, including contacting a light paraffinic hydrocarbon such as ethane, propane, n-butane, iso-butane, n-pentane, iso-pentane, etc., with a catalyst comprising an active metal selected from the group consisting of a Group VIII metal, such as platinum, rhodium, ruthenium, palladium, and nickel, and a Group VI–B metal, such as chromium, molybdenum and tungsten, in an amount between about 0.5 and 15% by weight of the finished catalyst and a promoter selected from the group consisting of Group I, Group II, Rare Earth, and Group IV–A metals of the Periodic System and mixtures thereof, in an amount between about 1 and 15% by weight based on the finished catalyst, both deposited on an inert oxide carrier; liquefying the effluent product, as by condensation or compression; flashing the dry gas portion containing hydrogen therefrom; if desired, further purifying the hydrogen by cryogenic, adsorption and diffusion methods, etc.; separating an unsaturated portion from a saturated portion of the remaining product, as by distillation, adsorption, solvent extraction, selective polymerization, selective aromatic alkylation, selective paraffin alkylation, etc., and recycling unreacted paraffins to the contacting step. The hydrogen recovered from the flashing step is also utilized for the hydrogenation of heavy unsaturated hydrocarbon materials, such as coal liquids, by contacting the heavy liquids with the hydrogen in the presence of a hydrogenation catalyst, preferably of the same character as the hydrogen-producing catalyst, and under conditions sufficient to hydrogenate the heavy liquids.

3,725,247

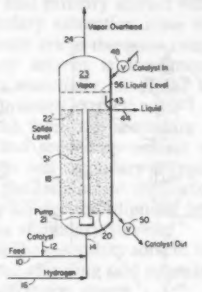
HYDROGENATION OF RESIDUUM

Axel R. Johnson, North Babylon, N.Y., and Ronald H. Wolk, Trenton, N.J., assignors to Hydrocarbon Research, Inc., New York, N.Y.

Filed Mar. 20, 1972, Ser. No. 236,359

Int. Cl. C10g *9/16, 13/02, 23/02*

U.S. Cl. 208—111 7 Claims



In the hydroconversion of certain petroleum stocks, such as Lloydminster crude mixtures from Canadian sources, acceptable desulfurization levels can only be obtained by the use of a desulfurization catalyst operating in upflow liquid phase in accordance with the ebullated bed system by maintaining a conversion rate such that a maximum heptane insoluble number of 60 is not exceeded.

3,725,248

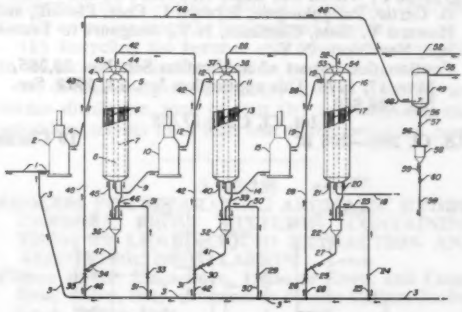
METHOD OF OPERATING A REFORMING PROCESS

Arthur Raymond Greenwood, Niles, and Kenneth Donald Vesely, Arlington Heights, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 860,905, Sept. 25, 1969, now Patent No. 3,647,680. This application Dec. 14, 1971, Ser. No. 207,910

Int. Cl. C10g *35/06*

U.S. Cl. 208—138 18 Claims



A method of operating a reforming process employing a platinum group metal catalyst. A multiple reactor system comprising the side-by-side reactors is employed, each reactor containing a dense-phase moving catalyst bed. The method of this invention enables processing of the catalyst through the reactor system in series flow, all reactors remaining on stream at reforming conditions. The method provides for relatively frequent regeneration, and catalyst activity is maintained at a predetermined high level without resort to increasingly severe reforming conditions.

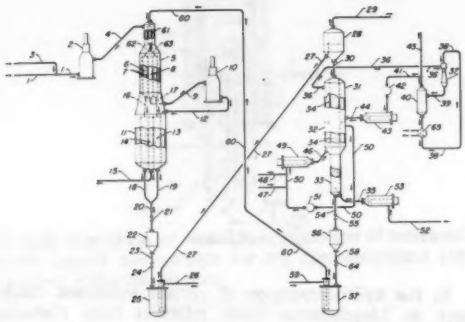
3,725,249
CONTINUOUS REFORMING-REGENERATION PROCESS

Kenneth Donald Vesely, Arlington Heights, and Arthur Raymond Greenwood, Niles, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 860,905, Sept. 25, 1969. This application Dec. 14, 1971, Ser. No. 207,869

Int. Cl. C10g *35/06*

U.S. Cl. 208—139 **21 Claims**



A method of operating a continuous reforming-regeneration process employing a halogen-containing platinum catalyst preferably comprising one or more promoter metals wherein catalyst activity is maintained at a predetermined level by continuous regeneration thereof without the removal of any reactor from the process stream. The method includes the continuous reduction and sulfiding of the catalyst prior to contact with the reactant stream, the reduction and sulfiding being effected in a confined zone in indirect heat exchange relationship with the preheated reactant stream charged to the reforming process.

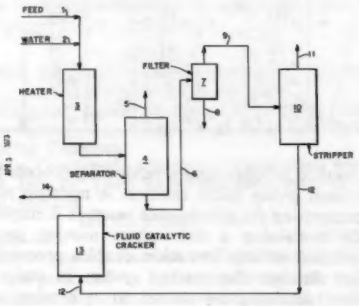
3,725,250
PROCESS FOR IMPROVING A HYDROCARBON CHARGE STOCK BY CONTACTING THE CHARGE WITH WATER AT ELEVATED TEMPERATURE AND PRESSURE

Raymond F. Wilson and Reese A. Peck, Fishkill, Norman D. Carter, Poughkeepsie, Edward L. Cole, Fishkill, and Howard V. Hess, Glenham, N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 20,285, Mar. 17, 1970. This application Jan. 22, 1971, Ser. No. 108,859

Int. Cl. C10g *17/08*

U.S. Cl. 208—208 R **10 Claims**



Oil refining is effected by heating under agitated flow conditions crude oil or residual oil with water at a temperature sufficient to form a foam which is cooled below the vaporization temperature of water to form a stable emulsion containing sulfur, carbon residues, asphaltenes, nickel and vanadium. After removal of the emulsion, the oil can be used as a fuel or in catalytic processes.

3,725,251
TWO-STAGE HYDRODESULFURIZATION OF A HIGH METAL CONTENT HYDROCARBON FEED

Seymour B. Alpert, Los Altos, Calif.; Ronald H. Wolk, Lawrence Township; Michael C. Chervenak, Pennington, both of N.J., and Govanon Nongbri, Newtown, Pa., assignors to Hydrocarbon Research, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 13,739, Feb. 24, 1970, abandoned. This application Nov. 8, 1971, Ser. No. 196,338

Int. Cl. C10g *23/02*

U.S. Cl. 208—210 **10 Claims**

A multi-stage process for the hydrodesulfurization of high metals content hydrocarbon feed materials wherein the first reaction zone is an ebullated bed contacting system using a powdered contact agent having particles in the size range from 40 to 325 U. S. mesh whereby superior metals removal is effected. The reduced metals content effluent is passed to subsequent stages wherein deep desulfurization is obtained due to low metals contamination of the catalyst. Build up of carryover contaminated catalyst from the first reaction zone is prevented by either an intermediate catalyst separation step between zones or use in the subsequent zones of ebullated bed systems incorporating catalyst of sufficiently large particle size whereby the powdered first zone catalyst is carried through and out of the subsequent zones.

3,725,252
DESULFURIZATION WITH SUBSEQUENT H S ABSORPTION

William H. Maier, Rosemont, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 27, 1970, Ser. No. 58,375

Int. Cl. C10g *23/02*

U.S. Cl. 208—213 **12 Claims**

Process for removal of a selected constituent from a vapor stream which comprises contacting the vapor stream in a high pressure absorption zone with a first stream of lean absorbent, mixing the resulting rich absorbent with a second stream of lean absorbent in a low pressure contacting zone, and separating the resulting mixture in a separation zone under conditions sufficient to provide selected constituent and separated lean absorbent. In a preferred embodiment, the separation zone comprises a phase separator and a low pressure absorption zone, the resulting mixture is passed from the low pressure contacting zone into the phase separator, and a resulting vapor stream is passed from the phase separator into the low pressure absorber wherein it is contacted with a third lean absorbent stream. The process has particular utility in the removal of selected constituent, such as an acid gas or mixture of acid gases, in a high pressure absorption zone maintained at a pressure in excess of 1,000 psig. Particular application is in the removal of hydrogen sulfide from a hydrogenation reaction zone, such as a hydrotreating zone or a hydrocracking zone, wherein a hydrocarbon charge stock containing organic sulfur compounds is desulfurized.

3,725,253

PROCESS FOR THE PURIFICATION OF MINERAL OIL

Shoji Yamada, Yokohama, Japan, assignor to Nippon Oil Company, Limited, Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 831,986, June 10, 1969. This application Dec. 7, 1971, Ser. No. 205,730

Claims priority, application Japan, June 25, 1968, 43/43,649

Int. Cl. C10g *23/00, 27/04*

U.S. Cl. 208—211 3 Claims

A process for the purification of mineral oil including a lube fraction comprising: reacting said mineral oil with oxygen-containing gases in the presence of at least one member selected from the group consisting of sulfuric acid and phosphoric acid as a catalyst at a temperature ranging from 180° C. to 280° C. thereby converting unstable compounds such as sulfur-containing compounds, oxygen-containing compounds, nitrogen-containing compounds, and organometallic compounds present in said mineral oil into compounds of greater molecular weight and increased polarity and separating said compounds from said mineral oil by vacuum distillation to obtain a refined mineral oil product, and further treating said refined mineral oil product in a fixed bed, suspension bed, or fluidized bed with a conventional hydrogenating catalyst under hydrogen pressure at a temperature ranging from 150° C. to 450° C.

3,725,254

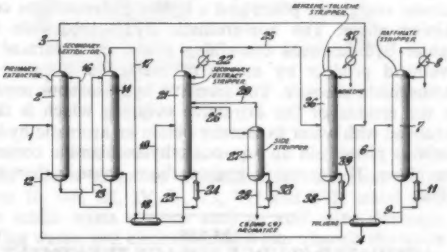
PROCESS FOR THE SEPARATION OF AROMATIC HYDROCARBONS FROM A MIXED HYDROCARBON FEEDSTOCK

Jui Chung Wang, St. Albans, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 13, 1971, Ser. No. 162,178

Int. Cl. C10g *21/02*

U.S. Cl. 208—314 10 Claims



A continuous process for separating aromatic hydrocarbons from mixed hydrocarbon feedstock containing aliphatic and aromatic hydrocarbons, said aromatic hydrocarbons being comprised of benzene, toluene, and C_8 aromatics, comprising the following steps:

(a) Contacting the feedstock with a primary solvent and a secondary solvent in a primary extraction zone at a temperature in the range of about 50° C. to about 150° C. and a pressure in the range of about atmospheric pressure to about 200 p.s.i.a. wherein the primary solvent is a water-soluble organic solvent, which has a higher boiling point than and is non-azeotropic with the feedstock, and the secondary solvent is selected from the group consisting of paraffinic and naphthenic hydrocarbons and mixtures thereof, said hydrocarbons having higher boiling points than and being non-azeotropic with the feedstock, and wherein the primary solvent is maintained in sufficient amount to extract essentially all of the aromatic hydrocarbons from the feedstock and the secondary solvent is maintained in sufficient amount to act as a reflux for the feedstock;

(b) Withdrawing from the primary extraction zone primary extract comprising aromatic hydrocarbons and primary solvent and raffinate comprising aliphatic hydrocarbons and secondary solvent;

(c) Contacting said primary extract with the secondary solvent in a secondary extraction zone wherein the temperature and pressure are in the same range as in step (a) and the secondary solvent is maintained in sufficient amount to extract essentially all of the aromatic hydrocarbons from the primary extract;

(d) Withdrawing from the secondary extraction zone primary solvent and secondary extract comprising aromatic hydrocarbons and secondary solvent;

(e) Subjecting the raffinate to distillation in a raffinate distillation zone whereby the aliphatic hydrocarbons are separated from the secondary solvent;

(f) Withdrawing the secondary solvent from the raffinate distillation zone and recycling said secondary solvent to at least one of the extraction zones;

(g) Recycling the primary solvent withdrawn from the secondary extraction zone to the primary extraction zone;

(h) Subjecting the secondary extract to distillation in an aromatics distillation zone having a maximum temperature of 225° C., the temperature gradient being such throughout the zone that about 90 to 99 percent by weight of the benzene and toluene in the extract enters into the vapor phase at the top of the zone; the C_8 aromatics and about 1 to 10 percent by weight of the benzene and toluene in the extract concentrate in the liquid phase at a point between about the middle of the zone and the top of the zone; and the secondary solvent remains essentially in the liquid phase and enters the bottom of the zone;

(i) Withdrawing the vapor phase mixture of benzene and toluene from the aromatics distillation zone in step (h)

(j) Withdrawing the liquid phase C_8 aromatics, benzene, and toluene from the aromatics distillation zone in step (h); and subjecting same to distillation in a side-distillation zone, said side-distillation zone containing about 40 to 60 percent of the number of equilibrium stages contained in the aromatics distillation zone and having a maximum temperature of at least 75° C. less than the maximum temperature of the aromatics distillation zone, and separating the C_8 aromatics from the benzene and toluene;

(k) Recycling the benzene and toluene from step (j) to the aromatics distillation zone; and

(l) Withdrawing the secondary solvent from the aromatics distillation zone of step (h) and recycling such secondary solvent to at least one of the extraction zones.

3,725,255

PROCESS FOR SEPARATING AROMATIC HYDROCARBONS FROM MIXTURES CONTAINING THEM BY LIQUID-LIQUID EXTRACTION AND AZEOTROPIC DISTILLATION

Filippo Barilli, Luigi Lugo, Lucio di Fiore, and Cesare Reni, Milan, Italy, assignors to Societa Italiana Resine, S.p.A., Milan, Italy

Filed May 4, 1971, Ser. No. 140,203

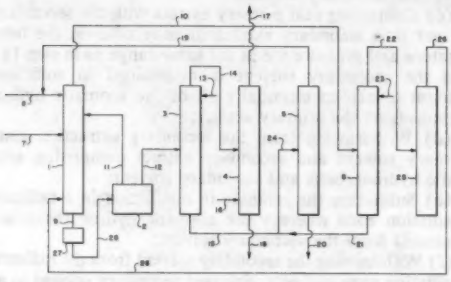
Claims priority, application Italy, May 12, 1970, 24,459/70

Int. Cl. C07c *7/10*; C10g *21/20*

U.S. Cl. 208—331 10 Claims

Aromatic hydrocarbons are separated from a mixture of liquid hydrocarbons. The mixture of liquid hydrocarbons is extracted in the liquid phase in an extraction zone at a temperature of about 40° C. to about 80° C. with ethylenediamine solvent having a water content of from 0% to 20% by weight to form an extracted phase and a raffinate phase. The extracted phase comprises pre-

dominantly aromatic hydrocarbons, solvent, and a minor amount of non-aromatic hydrocarbons. The raffinate phase comprises predominantly non-aromatic hydrocarbons. The extracted phase and the raffinate phase are separately collected. The extracted phase is cooled to a temperature at least 30° C. lower than the temperature of the extraction. The cooled extracted phase is then



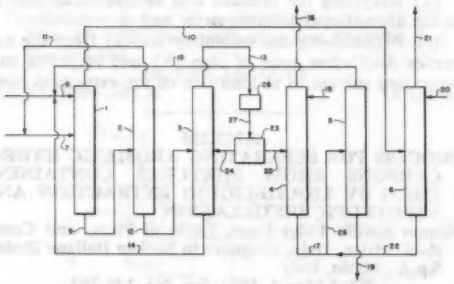
separated into a heavier solvent containing phase, and a lighter hydrocarbons containing phase which is scrubbed with water to obtain an aqueous ethylenediamine containing phase and a hydrocarbons phase. The hydrocarbons phase is azeotropically distilled to obtain an overhead product comprising non-aromatic hydrocarbons, and a bottom product consisting essentially of aromatic hydrocarbons which are subsequently rectified.

3,725,256

PROCESS FOR SEPARATING AROMATIC HYDROCARBONS FROM MIXTURES THEREOF WITH PARAFFINS AND NAPHTHENE HYDROCARBONS

Luigi Lugo, Benedetto, Calcagno, and Cesare Reni, Milan, Italy, assignors to Societa Italiana Resine, S.p.A., Milan, Italy

Filed May 4, 1971, Ser. No. 140,202
Claims priority, application Italy, May 12, 1970, 24,463/70
Int. Cl. C07c *7/10*; C10g *21/20*
U.S. Cl. 208—331 **9 Claims**



Aromatic hydrocarbons are separated from a mixture of liquid hydrocarbons. The mixture of liquid hydrocarbons is extracted in the liquid phase in an extraction zone with ethylenediamine having a water content of from 0% to 20% by weight to form an extracted phase and a raffinate phase. The extracted phase comprises predominantly aromatic hydrocarbons, solvent, and a minor amount of non-aromatic hydrocarbons. The raffinate phase comprises predominantly non-aromatic hydrocarbons. The extracted phase and the raffinate phase are separately collected. The non-aromatic hydrocarbons in said extracted phase are separated as overhead product by means of extractive stripping of the extracted phase, the aromatic hydrocarbons remaining in the residue of the extractive stripping. The residue of the extractive stripping is azeotropically distilled, the aromatic hydrocarbons and a minor amount of ethylenediamine solvent being collected as the overhead products. The ethylenediamine solvent is collected as the bottom product. The overhead products are cooled to separate them into an ethylenediamine containing phase and an aromatic hydrocarbons containing phase. The aromatic hydrocarbons containing phase is scrubbed with water to separate out a dilute aqueous ethylenediamine containing phase, and aromatic hydrocarbons phase, which is then rectified.

3,725,257

PROCESS OF SEPARATING AROMATIC HYDROCARBONS FROM HYDROCARBON MIXTURES

Carlo Cavenaghi, Lucio di Fiore, Filippo Barilli, and Benedetto Calcagno, Milan, Italy, assignors to Societa Italiana Resine, S.p.A., Milan, Italy

Filed May 4, 1971, Ser. No. 140,201
Claims priority, application Italy, May 12, 1970, 24,460/70
Int. Cl. C07c *7/10*; C10g *21/20*
U.S. Cl. 208—331 **11 Claims**

Aromatic hydrocarbons are separated from a mixture of liquid hydrocarbons. The mixture of liquid hydrocarbons is extracted in the liquid phase in an extraction zone at a temperature from about 40° C. to about 80° C. with ethylenediamine solvent having a water content of from 0% to 20% by weight to form an extracted phase and a raffinate phase. The extracted phase comprises predominantly aromatic hydrocarbons, solvent and a minor amount of non-aromatic hydrocarbons. The raffinate phase comprises predominantly non-aromatic hydrocarbons. The extracted phase and the raffinate phase are separately collected. The extracted phase is cooled to a temperature at least 30° C. lower than the temperature of the extraction step and then separated into a heavier solvent containing phase and a lighter hydrocarbons containing phase. The non-aromatic hydrocarbons in the lighter hydrocarbons containing phase are separated as overhead product by means of extractive stripping at atmospheric pressure. The aromatic hydrocarbons remain in the residue of the extractive stripping which is then scrubbed with water to thereby obtain an aromatic hydrocarbons phase and an aqueous ethylenediamine containing phase. The aromatic hydrocarbons phase is then rectified.

3,725,258

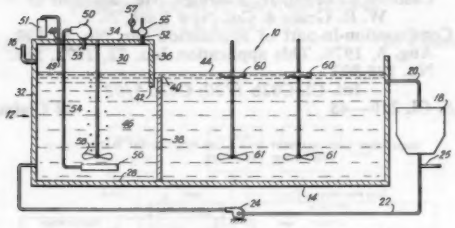
ACTIVATED SLUDGE SEWAGE TREATMENT PROCESS AND SYSTEM

Marshall L. Spector, Belle Mead, N.J., and Robert D. Jones, Allentown, and Curtis S. McDowell, Macungie, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of abandoned application Ser. No. 125,602, Mar. 18, 1971. This application Feb. 14, 1972, Ser. No. 226,199
Int. Cl. C02c *1/10*
U.S. Cl. 210—7 **7 Claims**

An activated sludge sewage treatment process and system which includes an initial enclosed aeration chamber providing a vessel for a mixed liquor, formed from a liquid biologically degradable waste and recirculated sludge, wherein the liquor is aerated with an oxygen-rich aeration gas and maintained at a relatively high level of dissolved oxygen, and a subsequent open aeration chamber wherein the liquor, after being treated in the enclosed vessel, is aerated in the presence of atmospheric air at a substantially lower level of dissolved oxygen. The system is designed so that between 25 to 95%, and preferably 50

to 95%, of the total oxygen utilized by the mixed liquor, to effect biological degradation, is utilized by the liquor in the enclosed vessel, and the remainder of the oxygen



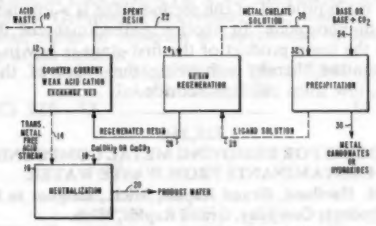
utilized by the liquor for biological degradation is utilized by the liquor when the liquor is in the open aeration chamber.

3,725,259

PROCESS FOR RECOVERY OF MINERAL POLLUTANTS FROM ACIDIC WASTE STREAMS

David O. De Pree, Loomis, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Dec. 4, 1970, Ser. No. 95,252
Int. Cl. C02b *1/46, 1/76*
U.S. Cl. 210—30 **13 Claims**



This patent describes a method for the removal of Group *Ib*, *IIb*, III, IV, V, VI, VII and VIII metal salts from acidic waste streams such as acid mine drainage, pickling waste, and electroplating waste wherein the waste stream is highly acidic and contains these metal salts as pollutants which comprises: contacting said stream in countercurrent fashion with a cation exchange bed containing a moderately strong or weakly acidic cation exchange resin to deposit metal ions from said salts thereon, neutralizing the acidic effluent from the cation exchange resin to provide a neutral effluent, and regenerating said cation ion exchange resin with a solution of a chelating agent.

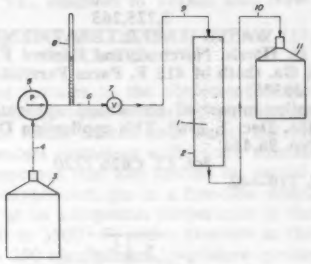
3,725,260

SEPARATION OF PESTICIDES FROM LIPIDS BY GEL PERMEATION CHROMATOGRAPHY

David L. Stalling and Roger C. Tindle, Columbia, Mo., assignors to the United States of America as represented by the Secretary of the Interior

Filed Dec. 28, 1971, Ser. No. 213,118
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 C **2 Claims**

Cleanup of lipid samples, for subsequent analysis of pesticide content, is accomplished by means of gel permeation chromatography. The gel employed comprises a styrene-divinylbenzene copolymer and cyclohexane, with



cyclohexane also serving as solvent for elution of the sample.

3,725,261

REMOVAL OF MERCURY FROM LIQUIDS USING KERATIN DERIVATIVES

Mendel Friedman, Moraga, Calif., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Nov. 5, 1971, Ser. No. 196,174
Int. Cl. C02c *5/02*
U.S. Cl. 210—38 **3 Claims**

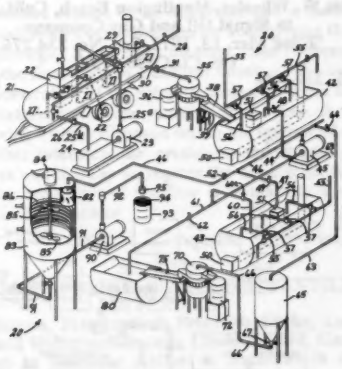
Mercury is effectively removed from water or other liquids by contact with a keratin derivative, e.g., reaction products of reduced wool with N-vinylimidazole, N-vinylpyrrolidone, or 2-vinylpyridine.

3,725,262

SYSTEM AND PROCESS FOR RECLAIMING FORGING COMPOUNDS

William G. Mattice and David A. Sanford, Eau Claire, Wis., assignors to Waste Research and Reclamation Co., Inc., Eau Claire, Wis.

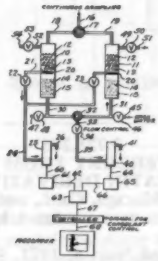
Filed June 21, 1971, Ser. No. 154,809
Int. Cl. B01d *35/06*
U.S. Cl. 210—42 **11 Claims**



A process for reclaiming a graphite-containing forging compound wherein the removal of fine metallic contaminants (e.g. metallic shavings of less than 200 mesh size, .074 mm.) is accomplished utilizing magnetic separation. The forging compound is initially preheated to increase the viscosity thereof and, after undergoing filtering to remove solid contaminants larger than the graphite, the fine magnetically attractive contaminants are magneti-

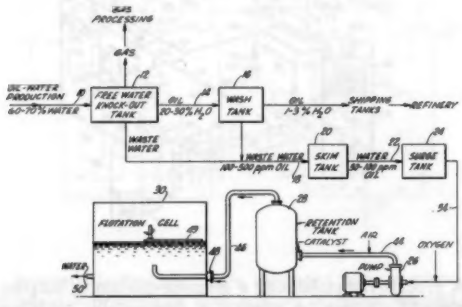
cally separated out of the forging compound. The compound is then sequentially heated to cause dehydration and cooled to ambient temperature while undergoing blending to provide a homogeneous product.

3,725,263
WASTE WATER TREATMENT
Robert H. Harris, Norcross, and Edward F. Morey, Atlanta, Ga. (both of 415 E. Paces Ferry Road, Atlanta, Ga. 30305)
Continuation-in-part of abandoned application Ser. No. 881,485, Dec. 2, 1969. This application Dec. 15, 1970, Ser. No. 98,444
Int. Cl. C02b *1/20*
U.S. Cl. 210—42 **14 Claims**



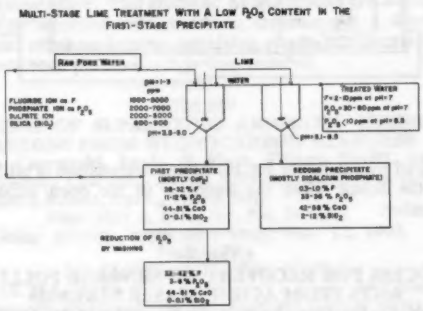
The addition of clarification chemicals in a filtration process is precisely controlled by the continuous sampling of chemically treated unfiltered water passing through a coarse to fine media bed of a pilot filter device. The pilot filter device measures turbidity of water which passes at a point intermediate through the filter media bed and which leaves the filter as final effluent. By establishing and maintaining an optimum relationship of the intermediate and the effluent turbidities, the proper metering of clarification chemicals is readily achieved in that both underdose and overdose of chemicals is quickly detected.

3,725,264
WASTE WATER TREATMENT PROCESS
Douglas W. Wheeler, Huntington Beach, Calif., assignor to Signal Oil and Gas Company
Filed Mar. 13, 1972, Ser. No. 234,276
Int. Cl. C02b *1/34*
U.S. Cl. 210—44 **10 Claims**



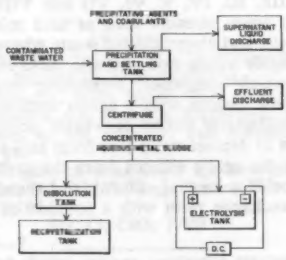
A method for removing residual oil and dissolved sulfides from oil production waste waters prior to disposal of the waste water into the ocean, by the injection of controlled amounts of oxygen, air, and a catalyst to oxidize the sulfides to free sulfur into the waste water. The mixture is pumped under pressure into a flotation cell or tank where the pressure is released and the sulfur and oil are separated from the water by flotation.

3,725,265
PURIFICATION OF WASTE WATER
Casimer C. Legal, Jr., Elkridge, Md., assignor to W. R. Grace & Co., New York, N.Y.
Continuation-in-part of application Ser. No. 61,530, Aug. 6, 1970. This application Jan. 22, 1971, Ser. No. 108,907
Int. Cl. C02b *1/20*; C02c *5/02*
U.S. Cl. 210—45 **24 Claims**


MULTI-STAGE LIME TREATMENT WITH A LOW P2O5 CONTENT IN THE FIRST-STAGE PRECIPITATE
RAW PORE WATER
LIME
WATER
TREATED WATER
FIRST PRECIPITATE (MOSTLY CaF2)
SECOND PRECIPITATE (MOSTLY DICALCIUM PHOSPHATE)
REDUCTION OF P2O5 BY WASHING

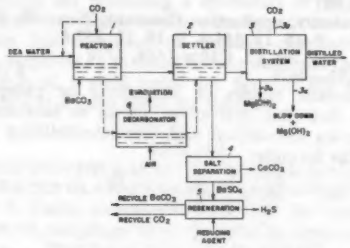
A multi-stage liming process is described which purifies waste water by controlling the pH of the waste water, e.g., as from a phosphate fertilizer plant, and thereby permitting selective precipitation of impurities in the waste water and their recovery as useful by-products of the process. In one embodiment of the invention the main product of the first stage is a low silica calcium fluoride, and the main product of the second stage is a low fluorine dicalcium phosphate. In another embodiment of the invention the main product of the first stage is low in phosphate content thereby enhancing the value of the by-product, low silica calcium fluoride.

3,725,266
PROCESS FOR REMOVING METAL COMPOUND CONTAMINANTS FROM WASTE WATER
Joseph M. Haviland, Grand Rapids, Mich., assignor to Haviland Products Company, Grand Rapids, Mich.
Filed Aug. 12, 1971, Ser. No. 171,105
Int. Cl. C02c *5/02*
U.S. Cl. 210—45 **9 Claims**



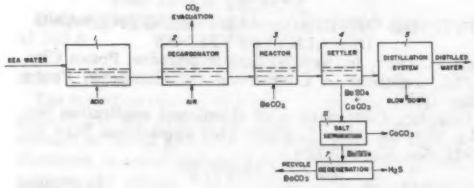
A process for removing one or more metal compound contaminants from contaminated industrial waste water comprising precipitating the metal compound contaminants from the waste water to form an aqueous metal compound sludge, allowing the sludge to settle, concentrating the sludge by centrifugation and reclaiming the metal compound contaminants from the sludge for reuse as either the metal compounds or the free metals.

3,725,267
SOFTENING OF SEA WATER BY ADDITION OF BARIUM CARBONATE AND CO_2
P. Gideon Gelblum, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of the Interior
Filed Feb. 14, 1972, Ser. No. 225,940
Int. Cl. C02b 5/02
U.S. Cl. 210—48 16 Claims



To reduce or prevent scaling during distillation, barium carbonate and small, catalytic amounts of CO_2 are added to sea water to form barium bicarbonate in situ which rapidly reacts with sulfate and calcium, and forms precipitate consisting essentially of barium sulfate and calcium carbonate. The softened water can then be heated to precipitate out magnesium hydroxide.

3,725,268
SOFTENING OF SEA WATER BY ADDITION OF BARIUM CARBONATE AND MINERAL ACID
P. Gideon Gelblum, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of the Interior
Filed Feb. 14, 1972, Ser. No. 225,941
Int. Cl. C02b 5/02
U.S. Cl. 210—53 14 Claims



To reduce or prevent scaling during distillation, barium carbonate and small, catalytic amounts of mineral acid or its oxide are added to sea water to form barium bicarbonate in situ, which rapidly reacts with sulfate and calcium, and forms a precipitate consisting essentially of barium sulfate and calcium carbonate.

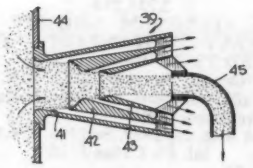
3,725,269
METHOD OF DECONTAMINATING AN ORGANOPHOSPHORUS INSECTICIDE
Billy C. Wolverton, Picayune, Miss., assignor to the United States of America as represented by the Secretary of the Air Force
No Drawing. Filed Nov. 24, 1971, Ser. No. 201,951
Int. Cl. C02c 5/02
U.S. Cl. 210—59 2 Claims

A solution for decontaminating and converting selected organophosphorus insecticides into products which can be water washed and discharged into streams without the usual toxic effects to fish normally exhibited by unaltered insecticides.

3,725,270
POLLUTION ABATEMENT PROCESS FOR REFINERY WASTE WATER
Joseph P. Tassoney, Whittier, Calif., and Roger M. Dille, Richmond, Va., assignors to Texaco Inc., New York, N.Y.
No Drawing. Filed Feb. 25, 1971, Ser. No. 119,054
Int. Cl. C02c 5/04
U.S. Cl. 210—63 9 Claims

This process pertains to the abatement of pollution from sulfide-bearing waste waters. Waste aqueous solutions e.g., sour water, treated sour water, and other refinery waste waters containing sulfides are admixed with a hydrocarbonaceous fuel and reacted by partial oxidation with an oxygen-rich gas in a free-flow noncatalytic gas generator at an autogenous temperature in the range of about 1500 to 3500° F. and a pressure in the range of about 1 to 250 atmospheres to produce synthesis gas from which hydrogen sulfide may be subsequently recovered and converted into by-product sulfur.

3,725,271
APPARATUS AND METHOD FOR SEPARATING PARTICLES FROM A FLOW OF FLUID
Hugo V. Giannotti, East Patchogue, N.Y., assignor to Giannotti Associates, East Patchoque, N.Y.
Continuation of Ser. No. 733,742, May 28, 1968, abandoned, which is a continuation of Ser. No. 340,913, Jan. 29, 1964, abandoned. This application Nov. 24, 1970, Ser. No. 92,518
Int. Cl. B01d 57/00
U.S. Cl. 210—65 4 Claims



The disclosure relates to an apparatus and a method for separating salt from a brine solution for accelerating the brine solution through a nozzle member and subsequently decelerate the flow through a diffuser member. The acceleration and deceleration of the solution causes the brine to move into a predetermined stream portion of the flow. A tubular passage having its inlet disposed within the interior of the diffuser member intersects the predetermined stream portion and receives and thereby segregates the brine from the flow, whereby the remainder of the flow is water with a reduced concentrate of salt therein.

3,725,272
FLAMEPROOFING AGENT FOR TEXTILE MATERIALS
Harro Petersen, Frankenthal, Friedrich Fuchs, Ludwigshafen, and Wilhelm Ruemens, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed July 21, 1970, Ser. No. 56,963
Int. Cl. C09k 3/28
U.S. Cl. 252—8.1 7 Claims

A novel flameproofing agent for textile materials containing as active ingredients a carbamoyl alkane phosphonic acid dialkyl ester free from N-hydroxymethyl and N-alkoxymethyl groups and an N-hydroxymethyl compound of an amino-s-triazine which may be non-etherified or partly or completely etherified at the N-hydroxymethyl groups.

3,725,273
GREASE COMPOSITION
John B. Christian, Yellow Springs, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force
No Drawing. Filed Dec. 3, 1969, Ser. No. 881,918
Int. Cl. C10m *7/50, 7/28*
U.S. Cl. 252—13 3 Claims

A grease composition consisting essentially of methylphenyldimethyl polysiloxane fluid containing iron octoate as an antioxidant and thickened with asbestos, fluorinated ethylenepropylene copolymer, and ammeline.

3,725,274
COMPOSITION AND METHOD FOR PREPARING METAL FOR COLD-WORKING
Gilbert H. Orozco, 2045 Hadden Road, Euclid, Ohio 44117
No Drawing. Filed Nov. 12, 1970, Ser. No. 89,083
Int. Cl. C10m *3/40, 3/48*
U.S. Cl. 252—18 10 Claims

Metal is prepared for cold working by coating it with an aqueous, soap-base lubricant comprising a meltable, water-soluble inorganic pigment, preferably borax and sodium nitrite, preferably a high molecular weight ester of a phosphoric acid, and at least one of the group consisting of water-swellable organic polymers, and hydrophilic colloids or hydrophilic carbohydrates to increase viscosity. Said coating is applied under conditions wherein the metal is heated above 150° F., preferably 170 to 210° F., excess water is vaporized, and a molten soap base film is produced. The film is then rapidly and artificially cooled, as with air jets, to convert the film to the solid state to prevent growth of precipitated pigment crystals.

3,725,275
COMPLEX ALUMINUM GREASES HAVING RELATIVELY CONSTANT CONSISTENCY AT ELEVATED TEMPERATURES
Crawford F. Carter, Concord, and John L. Dreher, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.
Filed Aug. 29, 1969, Ser. No. 854,199
Int. Cl. C10m *5/26*
U.S. Cl. 252—21 6 Claims

A grease comprising a major amount of mineral oil and minor amounts of (1) a complex aluminum soap (2) an alkali metal salt of a monocyclic aromatic carboxylic acid, and (3) a member selected from silica or ammonium-treated clay.

3,725,276
TUNGSTEN DISULFIDE LUBRICANT
Masashi Ohkage, 646 Hase, Kamakura, Japan
Continuation-in-part of abandoned application Ser. No. 792,134, Jan. 17, 1969. This application Aug. 3, 1971, Ser. No. 168,550
Claims priority, application Japan, Jan. 26, 1968, 43/4,721
Int. Cl. C10m *5/02*
U.S. Cl. 252—25 9 Claims

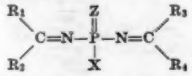
Make tungsten disulfide lubricant by reacting two to eight moles of sulfur with one mole of tungsten metal powder at high temperatures.

3,725,277
LUBRICANT COMPOSITIONS
Calvin J. Worrel, Detroit, Mich., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Original application Jan. 26, 1966, Ser. No. 523,022, now Patent No. 3,413,347, dated Nov. 26, 1968. Divided and this application May 31, 1968, Ser. No. 733,277
Int. Cl. C10m *1/20, 1/32*
U.S. Cl. 252—51.5 R 5 Claims

Reaction products of high molecular weight alkylphenols, aldehydes and N,N-dialkyl, hydroxylalkyl or aminoalkyl-alkylene diamines are ashless dispersants for lubricating oils.

3,725,278
LUBRICANT COMPOSITIONS
Klaus Hunger, Kelkheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Original application Feb. 4, 1969, Ser. No. 796,581, now Patent No. 3,646,134, dated Feb. 29, 1972. Divided and this application Mar. 18, 1971, Ser. No. 125,887
Claims priority, application Germany, Nov. 28, 1968, P 18 11 351.4, P 18 11 352.5
Int. Cl. C10m *1/46, 1/48*
U.S. Cl. 252—46.7 6 Claims

Bis-methylene amides of phosphoric or phosphonic acid, and their thio derivatives, useful as lubricant additives having antioxidant and thermal-stabilizing properties, of the formula:



wherein R_1–R_4, taken alone, are the same or different and are alkyl, cyclohexyl, phenyl, mono- or di-chloro- or bromophenyl, or alkylphenyl; or R_1 and R_2, taken together, or R_3 and R_4, taken together, are alkylene; X is alkyl, cyclohexyl, phenyl, or alkylphenyl bound directly to phosphorus or by way of an oxygen or sulfur atom, or morpholino or dialkylamino; and Z is oxygen or sulfur.

3,725,279
POLYUREA THICKENED GREASE
Eldon L. Armstrong, Mullica Hill, N.J., assignor to Mobil Oil Corporation
No Drawing. Filed Aug. 12, 1970, Ser. No. 63,324
Int. Cl. C10m *7/34*
U.S. Cl. 252—51.5 A 13 Claims

Improved greases, having wide-temperature utility and good oxidation stability, are provided comprising a hydrogenated olefin polymer vehicle and a grease-forming quantity of a thickening agent comprising a polyurea.

3,725,280
MIXTURES OF MONO-n-ALKYLBENZENES AND Di-n-ALKYLBENZENES
Albert M. Durr, Jr., and William R. Meador, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
No Drawing. Continuation of abandoned application Ser. No. 725,908, May 1, 1968. This application May 10, 1971, Ser. No. 148,266
Int. Cl. C10m *1/16*
U.S. Cl. 252—59 13 Claims

Lubricant oils comprising 5–30 parts by volume of mono-n-alkylbenzenes and 70–95 parts by volume of di-n-alkylbenzenes.

3,725,281
FERROMAGNETIC CHROMIUM DIOXIDE
Fritz Rodi, Kaldenhausen, and Franz Hund, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Dec. 28, 1970, Ser. No. 102,256
Claims priority, application Germany, Jan. 14, 1970, P 20 01 383.6
Int. Cl. C01g *37/02*
U.S. Cl. 252—62.51 7 Claims

In the production of ferromagnetic chromium dioxide wherein a chromium and oxygen containing compound is treated hydrothermally, there is used as the nucleating agent a compound of the formula A_2TeO_6 wherein A is one or more of chromium, iron, aluminum and gallium. The product is characterized by high coercivity in excess of 400 [Oe.] notwithstanding the use of relatively little tellurium.

3,725,282

PASSIVE WAKE QUENCHING SYSTEM USING NONABLATING MATERIAL, SULFUR AND A SOLID NOBLE GAS FLUORIDE

Elliott K. Weinberg, 1329 Tiger Tail Drive, Riverside, Calif. 92506

No Drawing. Filed Apr. 15, 1971, Ser. No. 134,470
Int. Cl. B64g 1/00
U.S. Cl. 252—62 5 Claims

A system for protecting a spacecraft or vehicle from heat when the vehicle reenters the earth's atmosphere is provided that comprises an ablative composition or a porous nonablating material having dispersed therein (1) a mixture of a solid noble gas fluoride and elemental sulfur or (2) a solid noble gas fluoride.

3,725,283

ELECTROSTATOGRAPHIC DEVELOPER CONTAINING UNCOATED GLASS-CERAMIC CARRIER PARTICLES

Robert D. Fenity, deceased, Webster, N.Y. (by Nancy Fenity, executrix), assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,497
Int. Cl. G03g 9/02
U.S. Cl. 252—62.1 13 Claims

Electrostatographic developer comprised of a toner and an uncoated carrier wherein the carrier comprises a crystalline phase dispersed in a glass matrix, and the crystalline phase is a Group IV metal oxide or a double oxide of tin, hafnium, germanium, zirconium or titanium and an alkaline earth metal or lead or cadmium. These carriers have the desirable properties generally associated with the coated carriers heretofore employed in the art, but unlike the coated carriers, are not prone to degradation and impactation and therefore have a longer useful life.

3,725,284

METHOD OF PRODUCING OXYGEN POOR GALLIUM ARSENIDE BY USING ALUMINUM WITH SILICON OR GERMANIUM AS A DOPANT

Wolfgang Touchy, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed April 28, 1971, Ser. No. 138,192
Claims priority, application Germany, April 30, 1970, P 20 21 345.0
Int. Cl. H01l 3/20
U.S. Cl. 252—62.3 GA 1 Claim

The invention relates to a method of producing oxygen poor gallium arsenide with silicon or germanium as a dopant. An element of the III group of the Periodic System, particularly aluminum, is added to the gallium arsenide containing melt for gettering the oxygen. The invention is particularly suited for the production of gallium arsenide, which is processed into luminescence diodes.

3,725,285

MAGNETIC COATING COMPOSITIONS

Hans H. Denk, Vienna, Va., and Joseph J. Sabad, Trenton, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed June 24, 1970, Ser. No. 49,508
Int. Cl. H01f 1/28
U.S. Cl. 252—62.54 4 Claims

Magnetic coating compositions comprising magnetic oxide pigment and a binder selected from certain water-based acrylic resin emulsions. The compositions of this invention are particularly suitable for imparting magnetic data fields to paper, card stock, film, or other substrates. They are particularly suitable for application to magnetic tapes to be subjected to high transport speeds past magnetic tape heads with which intimate contact must be maintained.

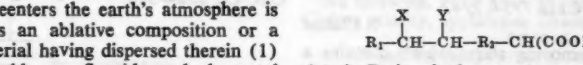
3,725,286

DETERGENT COMPOSITIONS

Robert Pettigrew, Bromborough, England, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Dec. 2, 1971, Ser. No. 204,348
Claims priority, application Great Britain, Dec. 4, 1970, 57,647/70
Int. Cl. C11d 3/04
U.S. Cl. 252—89 5 Claims

Fabric-washing detergent compositions incorporating, as detergency builders, water-soluble or water-dispersible salts of dicarboxylic acids having the general formula:



wherein R_1 is a hydrogen atom or an alkyl or substituted alkyl group containing from 6 to 20 carbon atoms, R_2 is an alkylene or substituted alkylene group containing from 0 to 4 carbon atoms and optionally incorporating hetero atoms as linking groups, the total number of carbon atoms in groups R_1 and R_2 being from 6 to 20, one or both of X and Y being non-ionisable atoms or groups, any other being hydrogen, and n is 0 to 1, are disclosed.

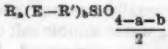
3,725,287

POLYSILOXANE COMPOSITION USEFUL AS A BRAKE FLUID

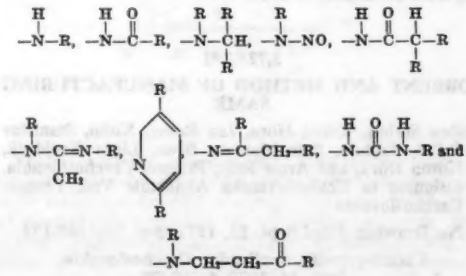
Frank J. Traver, Troy, N.Y., assignor to General Electric Company

No Drawing. Filed Apr. 8, 1971, Ser. No. 132,556
Int. Cl. C09k 3/00
U.S. Cl. 252—78 5 Claims

A siloxane polymer useful as a brake fluid comprising a polymer of the structure,



where R is a monovalent hydrocarbon radical or a halogenated monovalent hydrocarbon radical, R' is a divalent hydrocarbon radical which may be straight or branched chained, E is selected from the group consisting of $—NH_2$,



where R is as defined previously and the different R radicals can be the same or different, where a varies from 1.11 to 2.02, b varies from 0.023 to 1.00 and the sum of a plus b varies from 2.024 to 3.00. The present invention also comprises a brake fluid system using the above polysiloxane polymer as the brake fluid.

3,725,288

SOAP COMPOSITION

Charles Louis Bechtold, Edison, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 681,927, Nov. 9, 1967. This application Apr. 23, 1971, Ser. No. 137,076
Int. Cl. C11d 17/04
U.S. Cl. 252—91 10 Claims

Soap composition as an impregnant for scouring pads and the like comprises sodium nitrite, potassium carbon-

ate, polyglycol, sodium high lauric acid oil soap, sodium tallow soap and a foam builder.

3,725,289

STAIN REMOVING COMPOSITION

Gerard Marcel Mouret, 43 Avenue Simon Bolivar, Paris, France

No Drawing. Filed Apr. 23, 1971, Ser. No. 137,070

Claims priority, application France, June 18, 1970, 7022567

Int. Cl. C11d 7/54, 7/42

U.S. Cl. 252—95 7 Claims

A composition for removing stains which contains a proteolytic enzyme, a hydroxylamine compound or a hydrazine compound having at least one free hydrogen on the hydroxylamine or hydrazine nucleus, a perborate and an activator for the perborate.

3,725,290

OXYACETIC ACID COMPOUNDS AS BUILDERS FOR DETERGENT COMPOSITIONS

Douglas Carlyle Nelson, Glenview, and Edward Andrew Knaggs, Deerfield, Ill., assignors to Stepan Chemical Company, Northfield, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 98,887, Dec. 16, 1970. This application May 12, 1972, Ser. No. 252,718

Int. Cl. C11d 3/20; C07c 55/22, 55/24

U.S. Cl. 252—110 12 Claims

A phosphate-free biodegradable detergent builder compatible with various synthetic detergent and soap formulations to produce generally non-eutrophic detergent products. The builder is a water-soluble salt of an aliphatic oxyhydrocarbon carboxylic compound having carboxylic radicals separated from internal oxygen atoms by at least one unsubstituted hydrocarbon radical. A preferred builder is an alkyl metal salt of triglycolic acid and the builders of the invention are combinable in weight ratios with the detergent active surfactants in the formulations ranging from about 20:1 to about 1:10.

3,725,291

SORBENT AND METHOD OF MANUFACTURING SAME

Ctibor Serbus, Kutna Hora, Jan Rezac, Kolin, Stanislav Pribil, Trebon, Petr Marvan, Brno, Libor Krejdirik, Kutna Hora, and Artur Stoy, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

No Drawing. Filed Sept. 13, 1971, Ser. No. 180,133

Claims priority, application Czechoslovakia, Sept. 16, 1970, 6,310/70

Int. Cl. C02b 1/00, 5/00

U.S. Cl. 252—180 9 Claims

This invention is for a sorbent which comprises an active filler and an active binder, the filler comprising a biological substance, such as telomic plants or algae, and the binder omprising a water-insoluble hydrophilic polymer which preferably contains side groups or substituents which impart desirable sorption properties therein while at the same time acting as an agglomerating means for the active filler, that is, the biological substance and shaping or pelletizing of the mixture. The method of manufacturing the sorbents includes mixing dried and powdered biological substance with a solution of the water-insoluble, hydrophilic polymer in a solvent miscible with water, coagulating the mixture in an aqueous coagulating bath and simultaneously removing the solvent from the solid coagulated mixture.

3,725,292

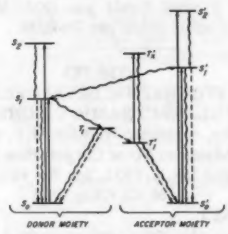
SINGLE AND DOUBLE ENERGY TRANSFER IN TRIPLET-TRIPLET PHOTOCHROMIC COMPOSITIONS

Gerard Ernest Gerhardt, Warren Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of abandoned application Ser. No. 729,592, May 16, 1968. This application Nov. 25, 1970, Ser. No. 92,913

Int. Cl. G02b 5/20; F21v 9/02, 9/06; G02c 7/10

U.S. Cl. 252—300 4 Claims



A photochromic composition of matter capable of exhibiting photochromism upon exposure to electromagnetic radiation, often colloquially called light, having a wavelength in the range of 200–2,000 nanometers, comprises:

(a) a polymeric substrate capable of transmitting light in the range of 200–2,000 nm. and

(b) about 0.0001 to 2.0% based on the weight of (a), of a photochromic compound of the formula:

$$(D)_m-x-(A)_n$$

wherein D is a chromophore moiety derived from a compound DH, which undergoes a transition to the first excited singlet state upon exposure to light having a wavelength in the range of 200–2,000 nm., x is a bridging function holding together the chromophores D and A; and A is a chromophore derived from the compound AH, which compound AH is characterized by a first excited singlet state at a higher energy level than the first excited singlet state of compound DH, and a lowest triplet state at a lower energy level than the lowest triplet state of compound DH whereby (1) light (electromagnetic radiation) is absorbed to raise one chromophore to an excited singlet, (2) the energy converts to the triplet state, and (3) in the triplet state a chromophore absorbs light at a different wavelength; the functions 1, 2 and 3 occurring in at least two separate bonded chromophores.

3,725,293

CONVERSION OF FUEL-METAL NITRATE SOLUTIONS TO OXIDES

Paul A. Haas, Knoxville, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Jan. 11, 1972, Ser. No. 217,038

Int. Cl. C01g 56/00

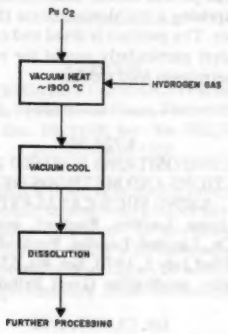
U.S. Cl. 252—301.1 R 9 Claims

A single-step method for converting an aqueous nuclear fuel metal nitrate solution to a fuel-metal oxide. A nitrate-reducing agent selected from the group consisting of hydroxylated organic compounds and hydrazine is added to the nitrate solution. The solution containing the additive is heated to an elevated temperature under pressure until the fuel-metal oxide is precipitated. The precipitated oxide then is recovered.

3,725,294
METHOD FOR DISSOLVING PLUTONIUM DIOXIDE

Ronald L. Deaton, Germantown, and Gary L. Silver, Centerville, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 27, 1972, Ser. No. 221,255
Int. Cl. C01g 56/00
U.S. Cl. 252—301.1 R 5 Claims



Method of dissolving refractory plutonium dioxide (PuO_2) by heating to convert plutonium dioxide to a lower oxide form, which is then dissolved in a suitable acid.

3,725,295
TECHNETIUM LABELING

William C. Eckelman, Hauppauge, and Powell Richards, Bayport, N.Y., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed July 20, 1971, Ser. No. 164,431
Int. Cl. A61k 27/04
U.S. Cl. 252—301.1 R 3 Claims

The process of using ^{99m}Tc in a radiopharmaceutical comprising the use of a stannous ion as the reducing agent with the pertechnetate ion containing the radionuclide.

3,725,296
OPENING RARE EARTH ORES WITH PERFLUOROALKANESULFONIC ACID

Karl F. Thom, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 872,726, Oct. 30, 1969, now Patent No. 3,615,169. This application Feb. 20, 1970, Ser. No. 13,158
Int. Cl. C07f 5/00
U.S. Cl. 252—301.1 R 9 Claims

Rare earth metals and related ions such as thorium are extracted from ores thereof by treatment with aqueous solutions of perfluoroalkanesulfonic acids. Trivalent metals are extracted preferentially; tetravalent metals tend not to dissolve as readily.

3,725,297
HALOPHOSPHATE PHOSPHOR TREATMENT PROCESS

George R. Gillooly, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

No Drawing. Filed Mar. 1, 1972, Ser. No. 231,024
Int. Cl. C09k 1/36
U.S. Cl. 252—301.4 P 5 Claims

This invention relates to a washing treatment for a halophosphate type phosphor and more particularly to a washing process for improving the luminescent output of alkaline earth halophosphate phosphors by removing any free antimony residue remaining after phosphor preparation and with modifications of the same washing treatment being further able to remove other residual impurities.

3,725,298
PREPARATION OF MIXED OXIDES

James Louis Woodhead, Didcot, Ronald Michael Dell, Goring-on-Thames, Anthony Richard Junkinson, Wantage, and Raymond Westrop Wilkinson, Goring-on-Thames, England, assignors to United Kingdom Atomic Energy Authority, London, England

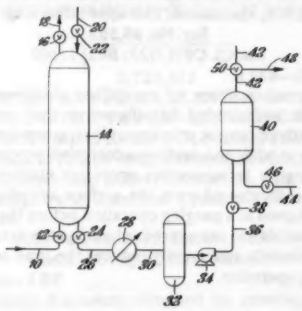
No Drawing. Filed Mar. 10, 1969, Ser. No. 805,860
Claims priority, application Great Britain, Mar. 12, 1968, 1,210/68
Int. Cl. B01j 13/00; C04b 35/26, 35/64
U.S. Cl. 252—317 7 Claims

A method of making mixed-oxides comprises taking an aqueous solution having the right balance of metal ions, dispersing it in an inert organic liquid, mixing it with a base solution in the inert organic liquid, especially a long chain aliphatic amine separating out the gel particles so formed and heating them to effect a solid state reaction.

3,725,299
REGENERATION OF MOLECULAR SIEVES HAVING SULFUR COMPOUNDS ADSORBED THEREON

Philip H. Turnock, Katonah; William G. Bancroft, and Max Lee, both of Yorktown Heights, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,679
Int. Cl. B01j 11/70; B01d 41/02
U.S. Cl. 252—411 S 3 Claims



The sweetening of natural gasoline liquid fractions employing molecular sieve type adsorbents to selectively adsorb the sulfur compound impurities is accomplished using a minimum of non-sorbable purge gas for regeneration purposes. The process comprises using a low boiling condensable paraffin to purge the sulfur compounds from the principal adsorption bed, condensing said paraffin, purifying same in the liquid phase by passage through a large pore molecular sieve bed, and thereafter removing the sulfur compounds from the latter bed with a non-sorbable purge gas.

3,725,300
REGENERATION OF BASIC ALUMINA USED AS A CATALYST IN DEHYDROHALOGENATION OF BETA-HALOALKYLPHOSPHONATE ESTERS

Walter Stamm, Tarrytown, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 696,991, Jan. 11, 1968, Pat. No. 3,576,924. This application Oct. 7, 1970, Ser. No. 78,947
Int. Cl. B01j 11/70, 11/02
U.S. Cl. 252—412 5 Claims

A process is provided for the preparation of α,β-olefinically unsaturated alkyl phosphonate esters by the dehydrohalogenation of the corresponding β-haloalkyl phosphonate esters comprising contacting the haloalkyl

phosphonate with basic alumina. A method is also provided for the regeneration of spent alumina catalyst by heating to a temperature in excess of 200° C.

3,725,301

POLYMERIZATION INITIATOR OF ORGANOALKALINE EARTH COMPOUND WITH ORGANOALUMINUM COMPOUND

Francis X. Mueller, Jr., Louisville, Ky., and James D. Brown, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 784,899, Dec. 18, 1968, Pat. No. 3,578,642. This application Oct. 12, 1970, Ser. No. 80,231

Int. Cl. C08g *17/02, 22/04, 23/00*

U.S. Cl. 252—431 R **9 Claims**

A polymerization initiator formed on admixing an organoalkaline earth compound and an organoaluminum compound, wherein the organoalkaline earth compound is the reaction product of an alkaline earth metal with a pyridine-type compound, polynuclear aromatic compound, or polyaryl-substituted ethylenic compound.

3,725,302

SILANIZED CRYSTALLINE ALUMINO-SILICATE

Jesse H. Shimely, and Edward D. Archer, Beacon, N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 850,285, June 17, 1969, Pat. No. 3,658,696, which is a continuation-in-part of Ser. No. 595,734, Nov. 21, 1966, abandoned. This application Aug. 31, 1970, Ser. No. 68,552

Int. Cl. C07f *7/22*; **B01j** *11/40*

U.S. Cl. 252—431 R **15 Claims**

The external surfaces of crystalline aluminosilicates are treated with hydrocarbyl halosilanes or their condensation products with ammonia, primary amines, secondary amines or alcohols to modify the surface adsorptive properties of the aluminosilicates. In separation processes employing crystalline aluminosilicates wherein the surface adsorbed materials must be removed in a purging operation before the initially adsorbed materials are recovered, silanizing the external surface of the aluminosilicates greatly reduces the time or severity of the purging operation.

3,725,303

BIMETALLIC CATALYST FOR USE IN REDUCING-OXYSULFUR COMPOUNDS

Peter Urban, Northbrook, and David J. Albert, Chicago, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 8, 1971, Ser. No. 113,724

Int. Cl. B01j *11/74*

U.S. Cl. 252—439 **10 Claims**

A novel bimetallic catalyst especially useful for the low temperature reduction of oxysulfur compounds with hydrogen, is disclosed. The bimetallic catalyst is a combination of catalytically effective amounts of molybdenum sulfide and of cobalt sulfide with a porous carrier material. It is prepared by impregnating the carrier material with a first metallic component drying and sulfiding to form a sulfided monometallic composite, purging free sulfide from contact with same, impregnating the resulting composite with the second metallic component to form a bimetallic composite, and thereafter, drying and sulfiding the resulting bimetallic composite to produce the bimetallic catalyst. The resulting bimetallic catalyst is especially useful in a method for reducing an inorganic, water-soluble oxysulfur compound wherein an aqueous solution of the oxysulfur compound and hydrogen are contacted with the bimetallic catalyst at reduction conditions.

3,725,304

HYDROCARBON CONVERSION CATALYST

Frederick C. Wilhelm, 30 Algonquin Road, Des Plaines, Ill.

Filed Dec. 28, 1970, Ser. No. 102,059

Int. Cl. B01j *11/78*

U.S. Cl. 252—441 **10 Claims**

A catalyst composite, method of manufacture and process for utilizing the catalyst. The catalyst comprises a tin component and a platinum component on a carrier material. A high surface area porous carrier material is impregnated with a solution comprising a trichlorostannate (II) chloroplatinate anionic complex. The product is dried and calcined to yield an improved catalyst particularly useful for reforming gasoline boiling range petroleum feed stocks.

3,725,305

CATALYST COMPOSITIONS FORMED BY TRANSITION METAL CATIONS AND METHODS OF MAKING AND USING SUCH CATALYSTS

Geoffrey Wilkinson, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed July 7, 1970, Ser. No. 53,031

Claims priority, application Great Britain, July 14, 1969, 35,249/69

Int. Cl. C07c *5/02*

U.S. Cl. 252—429 R **20 Claims**

Catalyst compositions containing the cations M_2^{2+}, $M_2(OCOR)_{4-n}^{n+}$, $M_2(OCSR)_{4-n}^{n+}$, $M_2(OCSR)_{4-n}^{+}$ where M is a transition metal which are useful for hydrogenation, hydroformylation, carbonylation, isomerization, disproportionation, and hydrosilation reactions, and methods of making by protonation of corresponding carboxylates, thiocarboxylates, or dithiocarboxylates.

3,725,306

NICKEL CARBONYL COMPLEX CATALYST

Jin Sun Yoo, South Holland, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed June 25, 1970, Ser. No. 49,968

Int. Cl. C07c *3/10*

U.S. Cl. 252—430 **18 Claims**

Novel heterogeneous, nickel-containing catalysts comprising

A. A nickel carbonyl complex, and

B. An acidic, solid, silica-based material are active in numerous reactive environments such as oligomerization, including homo- and co-dimerization, and polymerization of various olefins. In specific aspects, bis (triphenylphosphine) nickel dicarbonyl supported on an acidic, calcined, silica-alumina support containing a separate alumina phase, is active in, for instance, the oligomerization, particularly dimerization, of ethylene and propylene, the codimerization of a conjugated diene and an alpha-olefin and the polymerization of conjugated dienes.

3,725,307

PROCESS FOR PREPARING A SILVER-SUPPORTED CATALYST

David Brown, Greenwich, Conn., and Alfred Saffer, Bayside, N.Y., assignors to Halcon International, Inc., New York, N.Y.

Continuation of Ser. No. 456,003, May 14, 1965, abandoned, which is a continuation-in-part of Ser. No. 142,035, Oct. 2, 1961, abandoned. This application Jan. 30, 1967, Ser. No. 612,731

Int. Cl. B01j *11/20*; **C07d** *1/08*

U.S. Cl. 252—455 R **8 Claims**

A silver-supported catalyst is prepared by immersing a carrier of inert porous particles having an average diameter not larger than 3/16 inch, an average pore diameter of about 10–70 microns, and a surface area less than one square meter per gram in an aqueous solution of a silver salt whereby said

particles are impregnated with said solution, separating and drying the impregnated particles, and activating the dried particles by heating in air at a temperature sufficient to decompose the sliver salt. Silica-alumina support particles and a silver salt of an organic carboxylic acid such as lactic acid are preferably used in the process. Optionally, an alkaline earth promoter is added to the silver salt solution. The catalyst product is used in the production of ethylene oxide by the vapor phase oxidation of ethylene.

3,725,308

ELECTRICALLY CONDUCTIVE MASS

Marian J. Ostolski, 70 Piermont Place, Piermont, N.Y.

Filed Dec. 10, 1968, Ser. No. 782,758

Int. Cl. H01b *1/02*

U.S. Cl. 252—513 **7 Claims**

There is described a mass comprising finely divided particles of nickel or cobalt coated with gold or silver or platinum, and binder or matrix of organic or inorganic materials for holding the particles in contact with each other to provide a mass which is electrically conductive or semi-conductive and has properties approximating those of true gold or silver or platinum.

3,725,309

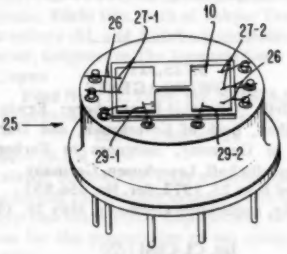
COPPER DOPED ALUMINUM CONDUCTIVE STRIPES

Irving Ames, Peekskill; Francois M. D'Heurle, Ossining, and Richard E. Horstmann, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,371

Int. Cl. H01b *1/02*; C22c *21/00*; H05k *1/00*

U.S. Cl. 252—512 **19 Claims**



This disclosure provides a copper doped aluminum conductive thin film stripe for use as a current-carrying member in a solid state microelectronic configuration which has substantial resistance against circuit failure due to damage caused by current-induced mass transport in the stripe. It has also been discovered for the practice of this invention that the addition of a relatively small amount of copper to an aluminum stripe together with a suitable heat-treatment enhances the extent of its lifetime during current conduction. Preferably, the percentage copper is from the neighborhood of 0.1 percent to the neighborhood of 10 percent by weight composition of copper in the aluminum and with an annealing heat-treatment in the approximate range of 250°C to 560°C. However, for certain operational conditions of the stripe a selected percent less than 54 percent copper by weight composition is advantageous.

3,725,310

SEMICONDUCTING CADMIUM CADMIUM-ZINC AND MERCURY PHOSPHIDE HALIDES

Paul Christopher Donohue, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 24,821, April 1, 1970, abandoned. This application Aug. 10, 1971, Ser. No. 170,622

Int. Cl. H01b *1/06*; C01g *11/00*

U.S. Cl. 252—518 **17 Claims**

Disclosed are phosphide halides of cadmium, cadmium-zinc, and mercury which are semiconductors and which may be doped with materials such as indium, copper, magnesium, and the like. The compositions are useful in semiconductor devices such as thermistors, rectifiers and visible light and infrared detectors.

3,725,311

LOW TEMPERATURE EXTRUDABLE ODOR-NEUTRALIZING COMPOSITION

Larry M. Grubb, Dallas, Tex., assignor to Thuron Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 10,993, May 15, 1972, abandoned. This application May 15, 1972, Ser. No. 253,666

Int. Cl. C11b *9/00*

U.S. Cl. 252—522 **4 Claims**

An extrudable composition and the process of producing it comprising a polymer of 80 to 98 percent PVC, 2 to 20 percent PVAc, and 0 to 20 percent PVA, a plasticizer, a filler to maintain a dry mixture and a volatile odor-neutralizing or modifying agent, the composition being extrudable at a temperature of below 250° F in order to avoid loss of the volatile odor-neutralizing agent through degradation or evaporation.

3,725,312

POLYQUATERNARY FLOCCULANTS AND PROCESSES OF PREPARING THEM BY QUATERNIZING ALKYLENE POLYAMINE RESIN POLYMERS FROM EPIHALOHYDRIN AND MONOALKYL AMINES

Hans Peter Panzer, and Robert Rabinowitz, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 16, 1971, Ser. No. 115,557

Int. Cl. C08g *23/12*; C02b *1/20*

U.S. Cl. 260—2 BP **9 Claims**

The cationic flocculant obtained by reacting a monoalkylamine, such as monomethylamine, with an epihalohydrin, such as epichlorohydrin, is quaternized with quaternizing agents, such as dimethyl sulfate, methyl chloride, ethylene oxide, and the like, producing a polyquaternary polymer. The polymer shows improved flocculating power in flocculating aqueous dispersions, such as raw river water, digestion liquors from ilmenite and sulfuric acid, enzyme mashes, sewage flocculation, sewage sludge dewatering, and the like. The polymers are also useful in systems which contain chlorine, such as chlorinated river water, as the quaternary groups are substantially non-reactive with chlorine.

3,725,313

SUSPENSION STABILIZERS

Gunter Naumann; Nikolaus Schon, both of Leverkusen; Hildegard Schnoring, Wuppertal-Elberfeld, and Gottfried Pampus, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed April 9, 1971, Ser. No. 132,913

Claims priority, application Germany, April 18, 1970, P 20 18 733.1

Int. Cl. C08g *23/12*

U.S. Cl. 260—2.1 R **4 Claims**

This invention relates to the use of rubber-like homopolymers and copolymers of conjugated diolefines or of cycloalkenamers as dispersion agents for the suspension condensation of epihalohydrins and polyalkylene polyamines.

3,725,314

RUBBER RECLAMATION USING ULTRASONIC ENERGY

Arnold H. Pelofsky, East Brunswick, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed June 25, 1971, Ser. No. 156,748
Int. Cl. C08f 47/24
U.S. Cl. 260—2.3 6 Claims

A process for dissolving solid rubber articles such as tires into a liquid vehicle which comprises contacting the rubber while immersed in the liquid with a source of ultrasonic energy whereby the bulk rubber effectively disintegrates upon contact and dissolves into the liquid.

3,725,315

METHOD FOR MAKING AN INSULATING BODY

Peter Bauer, Darmstadt, Germany, assignor to Rohm & Haas G.m.b.H., Darmstadt, Germany

Filed Nov. 6, 1970, Ser. No. 87,580
Claims priority, application Germany, Nov. 18, 1969, P 19 57 820.2
Int. Cl. C08f 47/10, 45/52
U.S. Cl. 260—2.5 B 6 Claims

A method of making insulating bodies by dispersing a resin, foamable at a temperature from about 150°C. to about 250°C., in molten asphalt maintained at these temperatures until foaming is complete, and then cooling the mixture.

3,725,316

SELF-EXTINGUISHING POLYURETHANES CONTAINING BROMINATED BENZO-QUINONES

Herbert Jenkner, Cologne-Deutz, Germany, assignor to Chemische Fabrik Kalk GmbH

Filed July 1, 1970, Ser. No. 51,665
Claims priority, application Germany, Sept. 17, 1969, P 19 46 954.6
Int. Cl. C08g 51/58, 41/00
U.S. Cl. 260—2.5 AJ 5 Claims

Polyurethane-based materials are rendered self-extinguishing by incorporating therein an effective amount of a brominated benzo-quinone.

3,725,317

NUCLEATION OF THERMOPLASTIC POLYMERIC FOAMS

Clifford P. Ronden, Edmonton, Alberta, Canada, and Donald C. Roylance, Potomac, Md., assignors to Cupples Container Co., Austin, Tex.

Filed Nov. 30, 1970, Ser. No. 93,881
Int. Cl. G08f 47/10; C08f 33/02
U.S. Cl. 260—2.5 E 15 Claims

In producing thermoplastic polymeric foams, particularly polystyrene, as by melt extrusion with the aid of a blowing agent, nucleation is accomplished by providing in the thermally plastified polymeric material the combination of an ammonium salt of a carboxylic acid, typically ammonium acetate, a carbonate or bicarbonate, and ammonium chloride. Under conditions of extrusion, for example, the two ammonium salts are thermally decomposed to yield both ammonia, as a nucleating agent, and acidic products which in turn react with the carbonate or bicarbonate to yield carbon dioxide as an additional nucleating agent.

3,725,318

PROCESS FOR THE MANUFACTURE OF POLYURETHANE FOAM BY CONTROLLING THE RATE OF HEAT GENERATION

Olle Bengtson, Goteborg, Sweden, assignor to Imperial Chemical Industries Limited, London, England

Filed March 9, 1971, Ser. No. 122,339
Int. Cl. C08g 22/44
U.S. Cl. 260—2.5 BD 5 Claims

A process for the manufacture of a polyurethane foam which comprises forming a reaction mixture containing an organic polyisocyanate, an organic polyol and an inert blowing agent having a boiling point not exceeding 50°C. at atmospheric pressure under such a pressure that the blowing agent is substantially in condensed form and releasing the pressure on said reaction mixture whereby it expands to form a froth which subsequently cures to form a foam, the reaction mixture having been brought to such a temperature, either before or during the release of pressure, that the rate of generation of reaction heat in said froth during the curing period is substantially equal to the rate at which heat is dissipated from the froth to its surroundings.

3,725,319

LOW SMOKE GENERATING PLASTIC COMPOSITIONS

Kurt C. Frisch, Grosse Ile, Mich., assignor to Owens-Corning Fiberglas Corporation

Continuation-in-part of Ser. No. 33,894, May 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 11,913, Feb. 16, 1970, abandoned. This application March 28, 1972, Ser. No. 238,938
Int. Cl. C08g 51/56, 22/34, 22/44
U.S. Cl. 260—2.5 AW 7 Claims

This disclosure concerns isocyanurate-urethane plastic compositions having low smoke generating properties under fire conditions. Reduction of smoke generation is achieved by the addition to the plastic compositions of an alkali metal fluoroborate or ammonium fluoroborate or mixtures thereof.

3,725,320

AGING OF IMPREGNATED FOAMABLE BEADS

Jerry Chi Wang, Lodi, N.J., assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed April 3, 1972, Ser. No. 240,781
Int. Cl. C08j 1/26, 1/30
U.S. Cl. 260—2.5 B 12 Claims

A process for aging polymer beads which have been impregnated with a volatile blowing agent wherein the improvement consists of aging in an inert atmosphere at controlled temperature to reduce the volatile impregnant content. The aging can be accelerated safely with incremental temperature increases.

3,725,321

BLOWING AGENTS

Wolf-Dieter Wirth, Odenthal-Hannenberg; Erwin Muller; Johannes Blahak, both of Leverkusen, and Harry Rohr, Cologne, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 25, 1972, Ser. No. 256,933
Claims priority, application Germany, May 26, 1971, P 21 26 146.1
Int. Cl. C08j 1/20
U.S. Cl. 260—2.5 R 19 Claims

The invention relates to the use of 2,4-dioxo-1,2-dihydro-4H-benzoxazine as well as derivatives therefrom as blowing agents for the production of cellular and porous articles. These compounds do not liberate any corrosive, discolorizing, malodorous or toxic decomposition products.

3,725,322

HEAT CURABLE ELASTOMERIC COMPOSITION AND PRODUCTS

Charles Leslie Weidner, Cranbury, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 87,336, Nov. 5, 1970, , which is a continuation-in-part of Ser. No. 672,464, Oct. 3, 1967, abandoned. This application April 23, 1971, Ser. No. 136,994
Int. Cl. C08g 37/16; C08d 9/10
U.S. Cl. 260—3 14 Claims

This specification discloses a new oil soluble phenol formaldehyde resin which comprises a reacted condensation catalyst

consisting essentially of an alkaline earth metal salt of a hydroxy ring substituted monobasic aromatic or phenyl terminated aliphatic acid. The catalyst first acts to catalyze the condensation process and then is available to act as an accelerator in the event the resulting resin is to be used for curing compositions such as pressure-sensitive adhesives. Reactive and non-reactive resins of this invention, corresponding adhesives, and various catalysts such as zinc salicylate and others, are disclosed.

3,725,323

CYCLOHEXYLAMMONIUM N-CYCLOHEXYLSULFMATE AS RESIN CATALYSTS

Karl Maurice Beck, Lake Bluff, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Filed July 27, 1971, Ser. No. 166,604
Int. Cl. C08g 9/10, 51/18, 51/24
U.S. Cl. 260—17.3 **7 Claims**

Formaldehyde-urea resins are catalyzed to form a solid resin of excellent bonding strength, using cyclohexylammonium N-cyclohexylsulfamate in small amounts for curing the resin at elevated temperatures.

3,725,324

ART OF MANUFACTURING DRY WALL TAPING AND FINISHING COMPOUNDS WITH A NITROGENOUS-MODIFIED AMYLACEOUS BINDER

Robert G. Cummisford, Brookfield, Wis., assignor to Krause Milling Company, Milwaukee, Wis.

Filed May 27, 1971, Ser. No. 147,644
Int. Cl. C08b 25/02; C08d 9/06
U.S. Cl. 260—17.4 ST **19 Claims**

Urea is combined with a gelatinized amylaceous material using water in an amount less than 20 percent of the total mix, and the mixture is subsequently heated to obtain a binder for use in a dry wall finishing compound.

3,725,325

GRANULATED VINYL CHLORIDE RESIN MATERIAL

Masao Takeda; Eiichi Iida, both of Tokyo; Tsuneo Komatsubara, Kamakura-shi, and Yutaka Kagoshima, Kawasaki-shi, all of Japan, assignors to The Japanese Geon Company, Ltd., Tokyo, Japan

Filed Nov. 12, 1969, Ser. No. 876,096
Claims priority, application Japan, Nov. 16, 1968, 43/83538
Int. Cl. C08f 45/24
U.S. Cl. 260—29.1 R **2 Claims**

A granulated material of vinyl chloride powder for paste processing having the specific average grain size, the specific bulk density and the specific dispersibility in plasticizer, and the process for the preparation of sol composition of vinyl chloride resin.

3,725,326

EPDM RUBBER TIRE CORD ADHESIVE FROM DICYCLOPENTADIENE LATEX AND RESORCINOL-ALDEHYDE RESIN

Thomas S. Solomon, Brecksville, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Continuation-in-part of Ser. No. 491,400, Sept. 29, 1965, abandoned. This application Jan. 30, 1969, Ser. No. 795,337
Int. Cl. C08f 5/00, 41/10
U.S. Cl. 260—29.3 **2 Claims**

A copolymer of dicyclopentadiene and a lower alkyl alpha-olefin, dispersed in water and combined with a water dispersion of resorcinol - formaldehyde resin is useful as a dip adhesive for rayon or nylon tire cord to adhere said cord to an EPDM carcass stock.

3,725,327

ZINC DI(LOWER ALKYL) DITHIOCARBAMATES AS MOLD INHIBITORS FOR LATEX PAINTS

Milo E. Stearns, and Wilbur S. Taylor, both of Westport, Conn., assignors to R. T. Vanderbilt Company, Inc., New York, N.Y.

Filed Nov. 16, 1970, Ser. No. 90,114
Int. Cl. C09d 5/14
U.S. Cl. 260—29.6 MM **10 Claims**

Zinc dimethyldithiocarbamate, when incorporated in latex paint in sufficient amount, inhibits the growth of mold on the paint film obtained upon drying of the paint.

3,725,328

LATEX COATING COMPOSITION HAVING YIELD VALUES OF 95-550 DYNES/CM² AND SHEAR STRESS OF AT LEAST 90 DYNES/CM² AT SHEAR RATE OF ABOUT 0.1-0.2/SEC.

S. T. Bowell, North Olmstead; Robert Ashcroft, Strongsville, and G. E. Pekarek, Cleveland, all of Ohio, assignors to SCM Corporation, Cleveland, Ohio

Filed Oct. 26, 1970, Ser. No. 84,192
Int. Cl. C08f 45/24
U.S. Cl. 260—29.6 R **2 Claims**

Novel compositions of aqueous compounded latex coatings adapted for airless spray application comprising film-forming latex and pigmentation dispersed in a bodied aqueous medium and exhibiting a defined yield point having a preferred shear stress of at least 90 dynes/cm² at a shear rate of between about 0.1 and 0.2 reciprocal seconds are described. A process for airless spray surface coating using the compositions of this invention and coated articles obtained thereby are also described.

3,725,329

PHOTOGRAPHIC SUBBING MATERIAL

Frederick J. Jacoby; Frederick L. Hamb, and Lewis C. Trent, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 865,184, Oct. 9, 1969, Pat. No. 3,658,541. This application Sept. 8, 1971, Ser. No. 178,834
Int. Cl. C08g 17/14, 51/30, 51/34
U.S. Cl. 260—32.8 R **8 Claims**

Solvent soluble carboxylated polyester subbing materials for photographic elements. An organic solvent soluble polyester is carboxylated by treatment, during the latter stages of polymerization, with an organic dianhydride to produce an organic solvent soluble carboxylated polyester. The solvent soluble carboxylated polyester is effectively used in subbing compositions, desirably containing attack solvent, e.g., coated onto a polyester photographic film support and has excellent adhesion both to the support and to conventional gelatin-cellulose ester subbing layers used to adhere a gelatino silver halide emulsion to the support.

3,725,330

SELF-ADHESIVE INSULATING COMPOSITION

Akira Shirato; Nishizawa Hitoshi, and Sawada Seizo, all of Yokohama, Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Kawasaki-shi, Japan

Filed April 2, 1970, Ser. No. 25,287
Claims priority, application Japan, Nov. 2, 1969, 44/89160
Int. Cl. C08c 11/22; C08d 9/08, 9/12
U.S. Cl. 260—33.6 AQ **34 Claims**

A self-adhesive insulating tape excellent in electrical properties and weather resistance can be prepared by shaping into a sheet a novel composition comprising (A) an ethylene-propylene-diene terpolymer, (B) an ethylene-propylene copolymer, (C) a tackifier selected from the group consisting of low molecular weight polyisobutylenes, terpene resins, coumarone-indene resins and novolak type phenol resins, (D) an inorganic filler and (E) a vulcanizing agent capable of vul-

canizing only the ethylene-propylene-diene terpolymer in this composition, vulcanizing the sheet and then cutting it to a given width. Said self-adhesive insulating tape is extremely suitable for forming insulating layers in connecting high voltage cables or in treating terminals.

3,725,331

COMPOSITIONS CONTAINING AMORPHOUS 1,2-POLYBUTADIENE AND CIS-1,4-POLYBUTADIENE

Jean Lesage, Le Vesinet, and Francois Dawans, Bougival, both of France, assignors to Institut Francois du Petrole, des Carburants et Lubrifiants, Hauts de Seine, France

Filed Oct. 8, 1970, Ser. No. 79,285

Claims priority, application France, Oct. 21, 1969, 6936148

Int. Cl. C08d *9/08*

U.S. Cl. 260—33.6 AQ **4 Claims**

New compositions consisting of 40-75 percent by weight of amorphous 1,2-polybutadiene having a molecular weight above 50,000 and 25-60 % by weight of 1,4-cis polybutadiene having a molecular weight above 100,000 result in sulfur vulcanizates having a low brittle point, a high elasticity modulus, and a low rebound and which swell to a relatively low degree when immersed in benzene.

3,725,332

ACRYLONITRILE-BUTADIENE-STYRENE COMPOSITIONS

Frederick E. Carrock, Paramus, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Dec. 15, 1970, Ser. No. 98,449

Int. Cl. C08k *1/36;* **C08d** *11/02*

U.S. Cl. 260—31.8 M **9 Claims**

Compositions which contain a blend of:

a. a first graft copolymer composition derived from the graft copolymerization of a diene-based rubber with, for example, acrylonitrile and styrene, where the rubber has a majority of its particles in the size range of about 0.8 to about 10 micron,

b. a second graft copolymer composition which has a majority of its particles in the size range of 0.005 to about 0.6 micron, and

c. 1 to 10 parts by weight of an epoxidized soybean oil or a mono- or disubstituted phthalic acid ester, e.g., dioctyl phthalate, have been been found to have much higher Izod impact strengths at a given melt flow range than similar blends that do not contain the epoxidized soybean oil or phthalic acid ester for the same total rubber concentration in the blend.

3,725,333

METHOD FOR PRODUCING FOUNDRY MOLDS AND FOUNDRY MOLDING COMPOSITIONS

William B. Adkins, Sidney; Thomas F. Bauer, Bainbridge, and James O. Beane, Sidney, all of N.Y., assignors to Borden Inc., New York, N.Y.

Filed April 20, 1970, Ser. No. 30,259

Int. Cl. C08g *5/04*

U.S. Cl. 260—38 **2 Claims**

Foundry molding composition is prepared by mixing a granular refractory material, such as sand, with a curing agent and a phenol-formaldehyde resin binder which has been modified with 10–70 percent, based on the weight of the resin, of furfural or furfuryl alcohol. The molding composition is blown into a pattern box preheated to 350°–600°F and cures in less than 60 seconds. The molds prepared from this molding composition demonstrate good resistance to water pick-up, have higher initial tensile strengths, much better retained strengths and do not impart pinholing effect to the castings manufactured therewith.

3,725,334

PHENOLIC RESIN-ISOCYANATE TRIMERIZATION PRODUCT AND FRICTION MATERIAL CONTAINING THE SAME

Franz Popp, Hamburg-Kirchwerder, and Wilfried Augustin, Reinbek, both of Germany, assignors to Jurid Werke GmbH, Hamburg, Germany

Filed May 18, 1970, Ser. No. 38,074

Claims priority, application Germany, May 29, 1969, P 19 27 254.9; May 29, 1969, P 19 27 255.0

Int. Cl. C08g *51/12;* **C09k** *3/14*

U.S. Cl. 260—38 **7 Claims**

At least one isocyanurate derivative is added to polymer or polymer mixtures as a stabilizing agent, preferably prior to molding and setting the blend. The isocyanurate derivative may be added in the form of an emulsion or dispersion in a liquid vehicle. An improved friction material contains an isocyanate derivative and a trimerization catalyst acting to react said isocyanate to said isocyanurate, in admixture with an organic binding agent comprising a phenolic resin and inorganic or organic fillers and, if desired, a natural or synthetic rubber.

3,725,335

BINDERS FOR MORTARS

Gerard Lefebvre, Lyon, France, assignor to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

Filed Feb. 17, 1971, Ser. No. 115,993

Claims priority, application France, Feb. 23, 1970, 7006349

Int. Cl. C08f *29/50*

U.S. Cl. 260—40 R **4 Claims**

An organic resinous binder composition which reduces shrinkage and shrinkage cracks in mortars formed thereof wherein the binder composition is formulated of an unsaturated polyester and a vinyl monomer such as styrene as the basic components and which includes a polyvinyl acetate in an amount within the range of 0.5 to 2 percent by weight and preferably 0.8 to 1.4 percent by weight of the unsaturated polyester and vinyl monomer.

3,725,336

THERMOPLASTIC COMPOSITION CONTAINING COPRECIPITATED FILLERS AND METHODS OF MAKING THE FILLERS

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Chiba-ken; Jiro Saito, Tokyo; Keiichi Murakami, Miyagi-ken, and Michio Hirakawa, Chiba-ken, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed April 23, 1971, Ser. No. 136,762

Claims priority, application Japan, April 25, 1970, 45/35748; April 25, 1970, 45/35749

Int. Cl. C08f *45/04*

U.S. Cl. 260—41 R **4 Claims**

A method for the preparation of a filler to be used with thermoplastic resins comprising a process of making the mixture of two or three members selected from the group consisting of sulfur dioxide, sulfur trioxide and carbon dioxide act on calcium hydroxide in the presence of water or a process of making either sulfur dioxide or sulfur trioxide or the mixture thereof act on calcium carbonate in the presence of water. Thermoplastic compositions containing the coprecipitated filler mixture have superior physical characteristics when compared to thermoplastic compositions which contain filler mixtures mechanically mixed.

3,725,337

PROCESS OF STABILIZING POLYETHYLENE SULFIDE

Jose L. Villa, Heightstown, N.J., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Division of Ser. No. 40,949, May 27, 1970, Pat. No. 3,582,521.
This application Feb. 16, 1971, Ser. No. 115,737
Int. Cl. C08g *17/58*
U.S. Cl. 260—45.8 R 4 Claims

A novel halogen adduct of ethylene sulfide,

wherein X is Br, Cl or I, is prepared and used as an oxidation stabilizer in a stabilizer system for an ethylene sulfide polymer to prevent the oxidation degradation of the polymer, particularly during processing. In a preferred process the oxidation stabilizer in the system is formed in situ in the polymer by polymerizing ethylene sulfide in the presence of from about 0.04 to 4 percent of Br_2, Cl_2 or I_2. A thermal stabilizer is added also to the polymer before high temperature processing to prevent thermal degradation.

3,725,338

THERMOSTABILIZED CHLORINE-CONTAINING POLYMERS

Lewis B. Weisfeld, Highland Park, N.J.; Holger Andreas, Bensheim-Auerbach, and Horst Muller, Fuerth, both of Germany, assignors to Ciba-Geigy Marienberg GmbH

Filed Sept. 4, 1970, Ser. No. 69,988
Claims priority, application Germany, Sept. 12, 1969, P 19 46 235.2
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.75 K 7 Claims

Compositions comprising an ester of aminocrotonic acid and 0.1 to 10 weight per cent of an organometal compound corresponding to the formula

$$[RR_a'R_b''MeZ_{3-a-b}]$$

wherein R, R′ and R″ are alkyl radicals having 1 to 8 carbon atoms and phenyl, Z is one-half oxygen or one-half sulfur, *a* and *b* are 0 or 1, Me is tin or lead and *n* is an integer of 1 to 1000, preferably 1 to 100, are useful heat stabilizers for halogen containing resins. Halogen containing resins suitable for stabilization with these compositions are polyvinyl chloride, polyvinylidene chloride, copolymers of vinyl chloride with vinylidene chloride, vinyl acetate and styrene as well as chlorinated mixtures of polyvinyl chloride and polyolefins.

3,725,339

PROCESS OF REACTING A HALOGEN-SILANE MIXTURE WITH AN ALCOHOL MIXTURE CONTAINING TERTIARY ALCOHOL

Gotz Koerner; Vaclav Kropac, both of Essen, and Gerd Rossmy, Essen-Werden, all of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Filed March 26, 1971, Ser. No. 128,464
Claims priority, application Germany, April 25, 1970, P 20 20 224.8
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 R 6 Claims

Silicone resin having a ratio of R : Si-groups of 0.95 to 1.5, the remaining Si-valences being satisfied by oxygen and alkoxy groups, the maximum amount of alkoxy groups being up to 0.75 mole of alkoxy per 100 g. R stands for methyl and/or (phenyl. 20 mole percent of the methyl and/or phenyl groups may be replaced by vinyl.

The silicone resin is produced by reacting a halogen silane mixture of an R : Si-ratio of 0.95 to 1.5 with a mixture consisting of

a. tertiary, chain-like aliphatic alcohols of 4 to 8 carbon atoms, and
b. primary and/or secondary chain-like aliphatic alcohols of 1 to 8, preferably 1 to 4 carbon atoms.

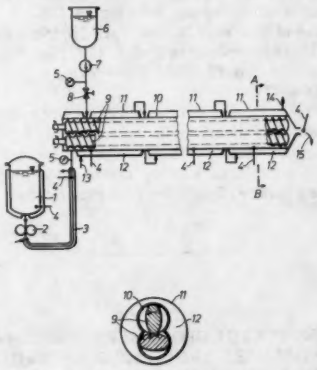
0.4 to 0.6 mole of tertiary alcohol are used per mole of silicon-attached halogen atom while 0.15 to 1 mole of primary and/or secondary alcohol are used per mole of tertiary alcohol. The reaction is effected at temperatures of between about 10° to 90°C. The reaction product may be subsequently further condensed.

3,725,340

PROCESS FOR THE PRODUCTION OF CROSSLINKABLE POWDER LACQUERS

Rudolf Erdmenger, Berg.-Gladbach; Martin Ulrich, Leverkusen-Schlebusch; Rolf Germedonk, Schildgen-Nittum; Josef Pedain, Cologne; Bernd Quiring, and Frank Wingler, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft

Filed Jan. 21, 1971, Ser. No. 108,389
Claims priority, application Germany, Jan. 27, 1970, P 20 03 415.5
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EP 9 Claims



Reacting lacquer resins containing hydroxyl groups with a softening point of from 50° to 150° C. and an alkoxymethyl isocyanate in the melt in a temperature-controlled screw extruder.

3,725,341

PROCESS FOR THE PREPARATION OF HIGH MOLECULAR WEIGHT POLYEPOXIDES FROM POLYEPOXIDES AND POLYHYDROXYL-CONTAINING COMPOUNDS

Morris Gwynne Rogers, Sarnia, Ontario, Canada, and James Hwa-San Tsai, Kaohsiung, Taiwan, assignors to The Dow Chemical Company, Midland, Mich.

Filed June 23, 1971, Ser. No. 156,101
Int. Cl. C08g *30/04*
U.S. Cl. 260—47 EP 9 Claims

The invention concerns a process for preparing epoxy resins of increased molecular weight by reacting a polyepoxide such as the diglycidyl ether of bisphenol-A with a polyhydroxyl-containing compound, such as bisphenol-A in the presence of an organometallic compound of tin, germanium, silicon and lead, such as trimethyltin chloride.

3,725,342

CURABLE COMPOSITION COMPRISING A DI-PRIMARY DIAMINE CONTAINING HYDANTOIN RINGS AND A POLYEPOXIDE COMPOUND

Daniel Porret, Binningen, and Juergen Habermeier, Allschwil, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 876,037, Dec. 12, 1969. This application July 12, 1971, Ser. No. 161,911
Int. Cl. C08g *30/14*
U.S. Cl. 260—2 N 1 Claim

New bis-(1-γ-aminopropyl-hydantoinyl-3)-alkanes, for example 1,6-bis-(1'-(γ-aminopropyl)-5',5'-dimethylhydantoinyl-3')-hexane or β,β'-bis(1-(3'-aminopropyl)-5,5-dimethylhydantoinyl-3)-diethyl ether, and their use as curing agents in curable moulding, coating and adhesive compositions which contain a polyepoxide compound, for example a liquid polyglycidyl ether of bisphenol A. Curing can be carried out at relatively low temperatures, for example at °° C. The new type of curing agent bridges, in respect of its gradation of reactivity, a gap between aliphatic polyamines and cycloaliphatic polyamines. The new curing agents furthermore have the advantage relative to the aromatic polyamines of being non-toxic.

3,725,343

POLYESTER FROM 1,4-DIMETHANOL-1,4 DIALKYL CYCLOHEXANE AND DICARBOXYLIC ORGANIC ACIDS

Ralph C. Schreyer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 722,204, April 18, 1968, Pat. No. 3,646,223. This application Nov. 4, 1971, Ser. No. 195,858
Int. Cl. C08g *17/04, 17/08*
U.S. Cl. 260—42 C 12 Claims

Polyester from 1,4-dialkyl-1,4-bis(hydroxymethyl) cyclohexanes and dicarboxylic organic acids having at least one carbocyclic ring. Synthesis from substituted butadiene and acrylic compound starting materials is disclosed. Advantages of a variety of polyesters are illustrated.

3,725,344

CROSSLINKED COPOLYMERS OF AROMATIC DIAMINODIAMES, AROMATIC DIAHYDRIDES AND AROMATIC DIAMINES AND METHOD OF PREPARATION

Yasuo Miyadera, 33-2, Nishi-Narusawacho-1-chome; Tatuo Masuko, 23-9, Osecho-3-chome; Tadashi Muroi, 67-4, Ishinazakacho; Hiroshi Noguchi, 2-20-274, Takasuzucho-1-chome, and Hideo Kawashima, 12-14, Nishi-Narusawacho-1-chome, all of Hitachi, Japan

Filed Aug. 12, 1970, Ser. No. 63,276
Claims priority, application Japan, Aug. 20, 1969, 44/66115
Int. Cl. C08g *33/02*
U.S. Cl. 260—47 CP 16 Claims

A novel copolymer is obtained by subjecting (1) an aromatic diaminodiamide compound whose amino group and amide group are bonded to an aromatic nucleus in a meta or para position to each other and whose amide group is a carboxylic acid amide group or a sulfonic acid amide group, (2) an aromatic tetracarboxylic acid dianhydride and (3) an aromatic diamine to reaction at a temperature not higher than 80°C in the presence of an inert solvent. By dehydrating and cross-linking the copolymer by heating to 100°C or higher, a novel, cross-linked copolymer having a good heat and abrasion resistance is obtained. When said dehydrating and cross-linking reaction is carried out in the form of an electric conductor coating, an electric wire having a good insulation effect is obtained.

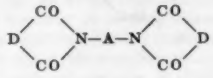
3,725,345

COMPOSITION COMPRISING AN EPOXY RESIN ACID ANHYDRIDE AND A N,N' BIS-IMIDE

Michel Bargain, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Jan. 14, 1971, Ser. No. 106,570
Claims priority, application France, Jan. 15, 1970, 7001414
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EC 14 Claims

A thermosetting composition which may be cured to give resins having good heat stability and rigidity comprising the reaction product of an epoxy resin, a carboxylic acid anhydride and a N,N'-bis-imide of the formula:



in which D represents a divalent radical containing a carbon-carbon double bond, and A represents a divalent radical containing at least two carbon atoms.

3,725,346

THERMALLY STABLE POLYINDANYL POLYMERS DERIVED FROM PHENYLENE OXIDES AND PROCESS FOR MAKING THE SAME

Roy G. Neville, San Carlos, Calif., assignor to Bechtel International Corporation

Division of Ser. No. 31,358, April 23, 1970, Pat. No. 3,663,625. This application Aug. 9, 1971, Ser. No. 170,340
Int. Cl. C08f *7/02*
U.S. Cl. 260—47 UA 3 Claims

This invention relates to a group of polyindanyl polymers derived from disubstituted phenylene oxides. When suitably catalyzed, the monomers of the invention are polymerized to materials that exhibit improved thermal stability, chemical resistance and mechanical flexibility. These polymeric products can be employed as adhesives, coating materials, and laminating resins; and, when suitably reinforced, they can be used as structural plastics.

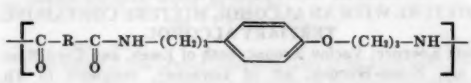
3,725,347

LINEAR POLYAMIDES HAVING HIGH GLASS TRANSITION TEMPERATURE PREPARED 4-(3-AMINO-PROPOXY)-PHENYL-3-PROPYLAMINE

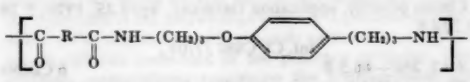
Tadanao Ando, Hiyogo; Seiichi Kataoka, and Isao Shiihara, both of Osaka, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 870,673, Dec. 24, 1969, abandoned. This application Oct. 6, 1971, Ser. No. 187,174
Int. Cl. C08g *20/20*
U.S. Cl. 260—47 CZ 1 Claim

A linear polyamide having a high glass transition temperature composed essentially of monomer units randomly distributed in the polymer chain, said monomer units having the formula



or



wherein R is a member selected from the group consisting of aliphatic, aromatic and aliphatic-aromatic radicals.

3,725,348

POLYESTER MODIFIED WITH METAL SALTS OF SULFOISOPHTHALIC ACID ESTERS AND POLY(ETHYLENE OXIDE) END CAPPED WITH ALKYL GROUPS

Albert Keith Harrison, and John Mather, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 783,419, Dec. 12, 1968, abandoned. This application Dec. 23, 1970, Ser. No. 101,118

Claims priority, application Great Britain, Dec. 5, 1967, 55,313/67

Int. Cl. C08g *17/14*, *17/18*

U.S. Cl. 260—75 S 4 Claims

Copolyesters of improved affinity for dyestuffs are manufactured by incorporating a poly(alkylene oxide) into a copolyester of which a proportion of the structural units are organic radicals containing at least one sulphonate group as the metal salt.

3,725,349

PHENOL-FORMALDEHYDE ADHESIVE RESINS CONTAINING POLY(C –C ALKYLENEOXY)GLYCOLS

Harry A. Smith, and Erwin H. Kobel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 100,502, Dec. 21, 1970, abandoned. This application June 12, 1972, Ser. No. 261,740

Int. Cl. C08g *5/18*

U.S. Cl. 260—58 7 Claims

Improved phenol-formaldehyde adhesive resins are obtained by premixing with aqueous formaldehyde about 0.3-1.5 parts per part formaldehyde of a poly(C_3—C_4 alkyleneoxy)glycol of Formula I:

$$HO—CHRCH_2—O—CH_2CHR—O_n—H \quad (I)$$

where R is C_1–C_2 alkyl and n is about 20–80, and thereafter reacting the formaldehyde-polyglycol solution with phenol in the presence of alkali. Preferred are liquid polypropyleneoxyglycols having an average molecuar weight of about 1,200–4,000. The resulting thermosetting resole adhesive resins are particularly suitable for plywood glues.

3,725,350

POLYMERIC SUBSTANCES COMPRISING THE REACTION PRODUCT OF MELAMINE, ALDEHYDE AND OXAZOLIDINES

Jerry H. Hunsucker, c/o Commercial Solvents Corp., Terre Haute, Ind.

Continuation-in-part of Ser. No. 36,679, May 12, 1970, abandoned. This application April 26, 1972, Ser. No. 247,680

Int. Cl. C08g *9/30*

U.S. Cl. 260—67.5 10 Claims

Prepolymeric resinous compositions from an oxazolidine and melamine and a lower aliphatic aldehyde. The resinous compositions polymerize on heating and have utility in baking enamels and in electrodeposition formulations to increase the solvent resistance of the film.

3,725,351

FIBERS OF POLYESTERS PREPARED FROM ETHYLENE GLYCOL, DIMETHYL TEREPHTHALATE, SODIUM DIMETHYL-5-SULPHOISOPHTHALATE AND POLY(ETHYLENE OXIDE)

Albert Keith Harrison, and John Mather, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation of Ser. No. 783,423, Dec. 12, 1968, abandoned. This application July 23, 1970, Ser. No. 64,052

Int. Cl. C08g *17/14*

U.S. Cl. 260—75 S 2 Claims

Fibers of copolyester of improved affinity for dyestuffs are derived from at least one dicarboxylic acid and at least 2 glycols, one of the glycols being a poly (alkylene oxide) and a proportion of the structural units of the copolyesters consists of organic radicals containing at least one sulphonate group as the metal salt.

3,725,352

ABA BLOCK POLYMERS OF POLYESTERS AND POLYETHERS

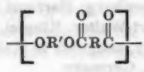
Joseph Victor Koleske; Rene Marie-Joseph Roberts, and Frank Paul Del Giudice, all of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,924

Int. Cl. C08g *39/10*

U.S. Cl. 260—75 R 4 Claims

The invention relates to novel, solid, substantially water-insoluble ABA block polymers in which the A blocks comprise recurring linear units of the formula



wherein the substituents R and R′ are divalent aliphatic groups and in which the B block comprises recurring oxyalkylene units. The block polymers have utility as plasticizers for polyvinyl chloride resins and as dye assists for polypropylene fiber.

3,725,353

AMINO ACID-URETHANE POLYMER COMPOSITIONS

Yasuo Fujimoto, Yokohama; Isao Masumura, Tokyo; Keizo Tatsukawa, Tokyo; Shinsuke Koshimoto, Tokyo, and Toru Doiuchi, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed April 12, 1971, Ser. No. 133,393

Claims priority, application Japan, April 17, 1970, 45/32358

Int. Cl. C08g *22/00*

U.S. Cl. 260—75 NK 12 Claims

Improved amino acid-urethane polymer compositions containing the reaction product of an intermediate polymer, obtained by the reaction of a polyesterpolyol with a polyisocyanate compound, and an amino acid N-carboxy anhydride or a polyamino acid and processes for the preparation of these compositions.

3,725,354

USE OF MIXED POLYAMINES FORMED BY THE ACID-CATALYZED CONDENSATION OF AN N-ALKYLANILINE, 2-CHLOROANILINE, AND FORMALDEHYDE AS CURING AGENTS FOR POLYURETHANES

Norman K. Sundholm, Middlebury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 796,549, Feb. 4, 1969, abandoned. This application June 23, 1971, Ser. No. 156,021

Int. Cl. C08g *22/16*

U.S. Cl. 260—75 NH 5 Claims

The mixtures of polyamines formed by the acid-catalyzed condensation of an N-alkylaniline, 2-chloro-aniline, and formaldehyde in certain ratios have im-proved properties for curing polyurethanes. They are readily blended with the liquid polyurethane because they are liquid or have low solidification points.

The properties of the cured polymer can be varied by selecting the proper curing agent, that is, those richer in N-alkylamiline providing softer products, or those richer in 2-chloroamiline providing harder products.

3,725,355
RAPID SETTING POLYURETHANE ELASTOMER COMPOSITIONS

Donald B. Parrish, Lake Jackson, and Franciszek Olstowski, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 21, 1971, Ser. No. 191,344
Int. Cl. C08g *22/10, 22/14*
U.S. Cl. 260—77.5 AP **21 Claims**

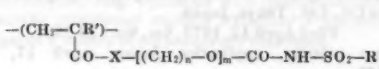
Rapid setting elastomers are prepared by mixing together (A) a polyether or ester modified polyether polyol having a molecular weight of above 2,000, (B) a polyhydroxyl accelerator-extender compound such as glycerine, (C) an isocyanate containing prepolymer, and (D) an organo-metallic catalyst such as lead octoate.

3,725,356
POLYMERIC N-CARBONYL SULFONAMIDES IN PHOTOPOLYMERIZABLE COMPOSITIONS AND PROCESS FOR PREPARATION

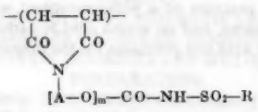
Walter Luders, Neu-Isenburg; Hartmut Steppan, Wiesbaden-Dotzheim, and Kurt-Walter Klupfel, Wiesbaden-Sonnenberg, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed June 2, 1971, Ser. No. 149,391
Claims priority, application Germany, June 4, 1970, P 20 27 466.2
Int. Cl. C08g *22/02, 22/04*; G03c *1/70*
U.S. Cl. 260—77.5 CR **3 Claims**

This invention relates to novel polymers and to a method of producing the same. The polymers are of reduced specific viscosity between 0.05 and 3.0, preferably between 0.2 and 1.0 dl/g., measured at 25° C. using a 1 percent solution in dioxane, contain substituted N-carbonyl sulfonyl groups in their side chains, and are composed of statistically distributed recurrent structural units
of Formula I'

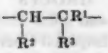


and/or
Formula II'



and/or
Formula III'

wherein
R is a saturated aliphatic alkyl or alkoxy group each with one to six carbon atoms which may be substituted by one to three halogen atoms, or a cycloaliphatic alkyl group, or an aryl or aryloxy group each with six or 10 carbon atoms which may be substituted up to 3 times by halogen atoms and/or alkyl or alkoxy groups with one to six carbon atoms,
R' is a hydrogen atom or a methyl group,
X is an oxygen atom or an imino group,
A is a phenylene group or an alkylene group with one to four carbon atoms,
n is an integer from 1 to 4, and
m is 1, or may be 0 when X is an imino group,
and which may further comprise, in a statistical distribution, recurrent structural units of the type



wherein
a. R^1 is a hydrogen atom or a methyl group,
R^2 is a hydrogen atom, and
R^3 is a nitrile group, a phenyl group, an amino-carboxyl group, an alkyl carboxyl group with two to 12 carbon atoms, or an acyloxy group with two to 12 carbon atoms, or
b. R^1 is an alkyl carboxymethyl group with three to 13 carbon atoms,
R^2 is a hydrogen atom, and
R^3 is an alkyl carboxyl group with two to 12 carbon atoms, or
c. R^1 is a hydrogen atom, and
R^2 and R^3 are both alkyl carboxyl groups with two to 12 carbon atoms.

3,725,357
TEMPERATURE STABLE FLEXIBLE ISOCYANATE-TERMINATED POLYMERS AND POLYISOCYANURATE POLYMERS THEREFROM

Hubert Jakob Fabris, Akron; Edwin Morgan Maxey, Kent, and Arden Everett Schmucker, Alliance, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Dec. 29, 1971, Ser. No. 213,826
Int. Cl. C08g *22/20, 20/00*
U.S. Cl. 260—77.5 NC **7 Claims**

A urethane-free trimerizable polymer for use in building isocyanurate structures that provide flexiblity, decreased friability and improved temperature stability therein is made by converting a nitro group on an aromatic nucleus that is terminal to a linear or substantially linear polymer of average molecular weight 600 to 3,000 to the corresponding isocyanate group for later incorporation into an isocyanurate structure.

3,725,358
POLYAMIDE FIBERS FROM MIXTURE OF 1,3-BIS-(4-PIPERIDYL) PROPANE AND BIS(P-AMINOCYCLOHEXYL) METHANE

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed April 12, 1971, Ser. No. 133,414
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R **11 Claims**

Polyamide fibers employing 1,3-bis(4-piperidyl)-propane as a comonomer in combination with bis(p-aminocyclohexyl)methane or methyl derivative thereof and an acyclic C_8 to C_{16} dicarboxylic acid are disclosed, the fibers having improved dyeability with retention of crystallinity.

3,725,359
FIRE RETARDANT RESIN COMPOSITIONS OF POST-CHLORINATED VINYL HALIDE-BIS(HYDROCARBYL) VINYLPHOSPHONATE COPOLYMERS

Jagadish C. Goswami, New York, N.Y., and Jung Il Jin, Irvington, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Dec. 23, 1970, Ser. No. 101,194
Int. Cl. C08f *27/03*
U.S. Cl. 260—78.5 BB **12 Claims**

There are disclosed post-chlorinated copolymers of: (1) one or more vinyl halides; (2) one or more bis(hydrocarbyl) vi-

nylphosphonates; and (3) as an optional component one or more ethylenically unsaturated monomers. These post-chlorinated products have a higher glass transition temperature than the copolymers from which they are derived and are, therefore, of greater utility in many applications such, for example, as in the preparation of polyblends with burning thermoplastics wherein they impart a significant degree of flame retardance without causing substantial reduction in the heat distortion temperature of the resulting polyblends.

3,725,360

PROCESS FOR POLYMERIZING STYRENE AND MALEIC ANHYDRIDE

Jack J. Adams, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed March 11, 1971, Ser. No. 123,386
Int. Cl. C08f *1/72, 15/02*
U.S. Cl. 260—78.5 R **12 Claims**

High yields, without the application of heat, are obtained when styrene and maleic anhydride are polymerized in the presence of a tertiary aliphatic mercaptan and certain metals. Preferably the monomers are dissolved in a halogenated aliphatic hydrocarbon solvent.

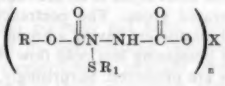
3,725,361

INHIBITING PREMATURE VULCANIZATION OF RUBBER WITH N-THIOHYDRAZODICARBOXYLATE

Kamel Boustany, 1328 Bell Crest Drive, and Aubert Y. Coran, 477 Greenhaven Circle, both of Akron, Ohio

Filed June 7, 1971, Ser. No. 150,801
Int. Cl. C08f *27/06;* **C08c** *11/40, 11/54*
U.S. Cl. 260—79.5 B **12 Claims**

A method is disclosed for inhibiting premature vulcanization of rubber by incorporating into the rubber an N-thiohydrazodicarboxylate of the formula



in which R and R$_1$ independently are alkyl, alkenyl, cycloalkyl, aralkyl and aryl; when n is one, X is selected from the same group as R and R$_1$ and when n is two, X is alkylene.

3,725,362

POLY(ARYLENE SULFIDE) COMPOSITION AND METHOD FOR DECREASING THE MELT FLOW OF POLY(ARYLENE SULFIDE)

John H. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed March 8, 1971, Ser. No. 122,254
Int. Cl. C08g *23/00*
U.S. Cl. 260—79 **16 Claims**

The melt flow of poly(arylene sulfides) is decreased by heating the polymer in the presence of a melt flow modifier comprising sulfur and a melt flow modifier rate accelerator such as zinc oxide at a temperature above the melt point of the resin. The poly(arylene sulfide) materials of decreased melt flow retain their thermoplastic character and are readily formed into useful shaped objects as by injection molding.

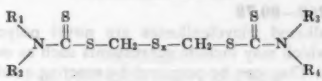
3,725,363

METHOD OF CURING ELASTOMERS WITH THIOCARBAMYL THIOMETHYL SULFIDES

Harry Elmer Albert, deceased, late of Lafayette Hills, Pa. (by Dorothy S. Albert, executrix), assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 781,691, Nov. 29, 1968, Pat. No. 3,579,516. This application Aug. 5, 1970, Ser. No. 61,467
Int. Cl. C08f *27/06*
U.S. Cl. 260—79.5 B **6 Claims**

Novel compounds having the structure



where R_1 and R_3 are alkyl or aryl, R_2 and R_4 are alkyl with the understanding that R_1 and R_2 and R_3 and R_4 may form a ring, and where x is an integer of from 2 to 6. These new compositions are useful as accelerators for the sulfur vulcanization of unsaturated elastomers and may be used as vulcanizing agents.

3,725,364

PROCESS FOR PREPARING ELASTOMERS OF ETHYLENE AND C_3-C_{10} ALPHA OLEFINS

Joseph Wagensommer, Westfield; Richard J. Lauria, Metuchen, and John H. Staib, Plainfield, all of N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 31,871, May 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 667,051, Sept. 7, 1967, abandoned, which is a continuation-in-part of Ser. No. 613,727, Feb. 3, 1967, abandoned, which is a continuation-in-part of Ser. No. 504,120, Oct. 23, 1965, abandoned, which is a continuation-in-part of Ser. No. 464,862, June 17, 1965, abandoned. This application Sept. 10, 1971, Ser. No. 179,546
Int. Cl. C08f *15/40, 15/04*
U.S. Cl. 260—80.78 **7 Claims**

A process for polymerizing ethylene and higher alpha olefins in the presence of a catalyst comprising an alkyl aluminum and the reaction product of a vanadium oxyhalide and an alkyl titanate. The resulting elastomeric polymers have exceptional tensile strength and green strength.

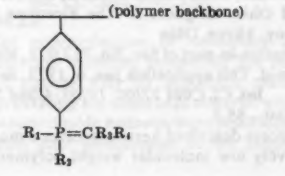
3,725,365

RESINS WITH PHOSPHORANE PENDANT GROUPS AND PROCESS FOR PREPARING SAME

Suzanne V. McKinley, Wellesley, and Joseph W. Rakshys, Jr., Framingham, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed April 8, 1971, Ser. No. 132,606
Int. Cl. C08f *19/00, 15/40*
U.S. Cl. 260—80.71 **17 Claims**

Novel carbon-to-carbon cross-linked resins having a plurality of phosphorane pendant groups are prepared by dehydrohalogenating the corresponding haloalkyl phosphonium salt. The phosphorane-containing resins are useful for converting ketones or aldehydes to olefins via the Wittig reaction. The pendant groups of the novel polymers have the structure



where R_1 and R_2 each independently is an alkyl or aryl group and R_3 and R_4 each independently can be hydrogen, alkyl, aryl, acyl, carbalkoxyl, carbamido or cyano group.

3,725,366

CYCLOALKENYL TRICYCLOALKENE COPOLYMERS AND PRODUCTION THEREOF

Yves Amiard, Pau, and Jean-Paul Bellissent, Billere, both of France, assignors to Societe Nationale Des Petroles D'Aquitaine, Courbevoie, France

Continuation-in-part of Ser. No. 833,696, June 16, 1969, Pat. No. 3,655,796. This application Feb. 4, 1971, Ser. No. 112,796
Int. Cl. C08f 17/00
U.S. Cl. 260—80.78 10 Claims

Cycloalkenyl tricycloalkenes are novel polycyclic compounds which may include substituents such as methyl, ethyl or others. They can be prepared by reacting a substituted or unsubstituted cyclic 1,3-diene with a 2,2'-dicycloalkenyl compound. The cycloalkenyl tricycloalkenes can be used to produce elastomers by copolymerization with non-conjugated polyenes and/or olefins.

3,725,367

PREPARATION WITH SEEDING OF POLYMERS INSOLUBLE IN THEIR MONOMERIC COMPOSITIONS

Thomas Kemp, 92-Bois-Colombes, France, assignor to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

Filed May 15, 1970, Ser. No. 37,852
Claims priority, application France, May 19, 1969, 6916089
Int. Cl. C08f 1/11, 1/13, 15/00
U.S. Cl. 260—80.81 28 Claims

Vinyl based polymers and copolymers and method for the preparation of same by first preparing a seeding latex by polymerization in fine suspension of monomers or comonomers having a vinyl base, preferably vinyl chloride, with an excess amount of organo-soluble catalyst and dispersing the seeding latex in monomers or comonomers having the vinyl base to form a polymerizing composition which is polymerized by heating.

3,725,368

PREPARATION OF POLYMERS

Robert C. Morrison, and Conrad W. Kamienski, both of Gastonia, N.C., assignors to Lithium Corporation of America, New York, N.Y.

Division of Ser. No. 4,126, Jan., 1970, Pat. No. 3,668,263. This application Aug. 25, 1971, Ser. No. 174,919
Int. Cl. C08f 3/16, 7/04, 19/04
U.S. Cl. 260—84.7 8 Claims

Production of polymers of conjugated dienes and/or vinyl-substituted aromatic compounds utilizing, in said production, polymerization initiator compositions comprising reaction products of C_2-C_{12} alkyllithiums with monomers from the group of polymerizable conjugated dienes and polymerizable vinyl-substituted aromatic compounds in a medium of aliphatic, cycloaliphatic or aromatic hydrocarbons and/or aliphatic tertiary monoamines or aryl ethers, the conjugated diene and vinyl-substituted aromatic compound portion of said initiator compositions being relatively nonpolymeric.

3,725,369

PROCESS FOR POSTREACTION OF ALKALI METAL-ACTIVE POLYMERS WITH SILICIC COMPOUNDS AND DIALKENYL COMPOUNDS

Adel F. Halasa, Bath, and Ervin E. Schroeder, North Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 717,071, March 27, 1968, abandoned. This application Jan. 6, 1971, Ser. No. 104,461
Int. Cl. C08f 27/00, 19/08; C08d 5/02
U.S. Cl. 260—85.1 19 Claims

The process described herein involves a method of converting relatively low molecular weight polymers of conjugated dienes prepared by alkali metal-catalyzed polymerizations, such as alkyllithium catalyzed polymerizations, and still containing active lithium or other alkali metal therein, by postreaction with a mixture of divinyl benzene and a silicon halide or ester or analogous material containing nitrogen or sulfur in place of the oxygen, to give higher molecular weight polymers having improved cold flow resistance, improved processability and green strength, etc. The improvements are much greater than can be effected by postreaction with either divinylbenzene or silicon halide, etc. individually, or by having divinyl benzene present during the polymerization. The silicon halide, etc. includes chloro, bromo and iodo compounds and can have one to four or even more halogen atoms per molecule. The postreacted products are highly branched elastomers having a broad molecular weight distribution and possessing less cold flow than the polymers from which they are produced. Surprisingly, the reaction product displays little or no tendency for cold flow even after extension with oil.

3,725,370

PROCESS AND PRODUCT OF TREATING LIVE POLYMERS WITH DIVINYL BENZENE AND AN ACTIVE HALOGEN COMPOUND

Adel F. Halasa, Bath, and Ervin E. Schroeder, North Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 716,321, March 27, 1968, abandoned. This application Jan. 6, 1971, Ser. No. 104,468
Int. Cl. C08d 5/04; C08f 27/02, 27/00
U.S. Cl. 260—85.1 18 Claims

The process described herein involves a method of converting relatively low molecular weight polymers of conjugated dienes prepared by alkali metal-catalyzed polymerizations, such as alkyllithium catalyzed polymerizations, and still containing active lithium or other alkali metal therein, by postreaction with a mixture of divinyl benzene and a halocompound having highly active halogen, such as bis(chloromethyl) ether, to give higher molecular weight polymers having improved cold flow resistance, processability, green strength, oil extendability, etc. The improvements are much greater than can be effected by postreaction with either the divinyl benzene or the highly active halocompound individually, or by having divinyl benzene present during the polymerization. The highly active halocompounds include chloro, bromo and iodo compounds in which the halogen is attached to a carbon atom alpha to an activating group such as a polar or unsaturated group. The postreacted products are highly branched elastomers having a broad molecular weight distribution and possessing less cold flow than the polymers from which they are produced. Surprisingly, even though the molecular weight of the polymer is increased many times, the reaction product displays little or no tendency for cold flow even after extension with oil.

3,725,371

CATALYZED MOLECULAR SIZING PROCESS

Jerome Robert Olechowski, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

Filed May 21, 1971, Ser. No. 145,956
Int. Cl. C08d 5/02; C08f 15/04
U.S. Cl. 260—85.3 R 20 Claims

Low molecular weight Butyl-type copolymers having narrow molecular weight distributions are prepared by contacting a higher molecular weight Butyl-type copolymer, e.g., a Butyl rubber, with a catalyst composition comprising a transition metal salt, an organometallic compound of a metal of Group I-A, II-A, II-B, or III-A of the Periodic Table, a proton donor, and carbon monoxide. The catalyst composition preferably comprises a halide of tungsten, molybdenum, or rhenium, an alkyl aluminum halide, a lower alkanol, and carbon monoxide.

3,725,372
PROCESS FOR OBTAINING MODIFIED POLYETHYLENES AND CROSS-LINKED POLYETHYLENES HAVING HIGH MECHANICAL, CHEMICAL AND ELECTRIC CHARACTERISTICS, AND POLYETHYLENE OBTAINED

Sergio Arrighetti; Giorgio Corradini, and Sebastiano Cesca, all of Milano, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed , Ser. No. 56,004
Claims priority, application Italy, July 18, 1969, 19811 A/69
Int. Cl. C08f *15/04*
U.S. Cl. 260—88.2 D 6 Claims

A polyethylene is disclosed that is modified by copolymerizing ethylene with a comonomer consisting of a minor quantity of a polycyclic polyene having at least three double bonds in the molecule, and preferably an endomethylenic bridge, so that it can be readily cross-linked under the influence of heat without the presence of an additive, but which still exhibits the characteristics of a conventional crystalline polyethylene.

3,725,373
PROCESS FOR HOMOPOLYMERIZING ACRYLONITRILE

Jin Sun Yoo, South Holland, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,373
Int. Cl. C08f *3/76*
U.S. Cl. 260—88.7 R 10 Claims

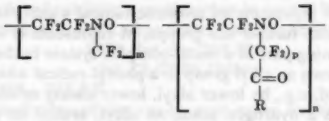
A process for the polymerization of acrylonitrile is provided using a catalyst which contains (A) an iron source, (B) an electron donor ligand, and (C) a reducing agent, in molar ratios of (B) to (A) of about 0.3 to 10:1 and of (C) to (A) of about 3 to 50:1. Preferred catalyst components are ferric acetylacetonate, bis(diphenylphosphino)-ethane and triethylaluminum.

3,725,374
CURED NITROSOFLUOROCARBON RUBBER

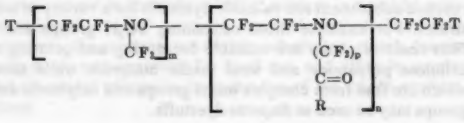
Nathan Mayes, Barrington, R.I.; Joseph E. Green, Brunswick, and Ronald Michaels, Boonton, both of N.J., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Oct. 30, 1970, Ser. No. 85,758
Int. Cl. C08f *3/24*
U.S. Cl. 260—92.1 6 Claims

A cured, nitroso polymer has been provided by curing polymers obtained by polymerizing monomers which have pendant groups convertible to pendant moieties which are crosslinkable. Some of these monomers with the crosslinkable, pendant groups cannot be introduced into the polymer directly. The polymers with the pendant groups are derived from monomers forming recurring units as represented by the general formulas:



or



wherein R is a —O—(lower alkyl) group of one to seven carbon atoms; p is from 1 to 6; T is a halogen, a perhaloalkyl, —NO, and $-NO_2$; and the ratio $m : n$ is from 0 : 1 to 50 : 1, preferrably n can be from 0.1 percent to 10 percent of the units in the polymer. The polymers are cured with such curing agents as an epoxide, a metal oxide, and chromium perfluoroacetate to produce rubbers having good physical properties and chemical resistance. Thus, liquid and solid polymers are provided as well as elastomers derived therefrom.

3,725,375
POLYMERIZATION PROCESS

Alan Charles Sturt, Guildford, England, assignor to BP Chemicals Limited, London, England

Filed May 14, 1970, Ser. No. 37,334
Claims priority, application Great Britain, May 19, 1969, 25,418/69
Int. Cl. C08f *3/30, 15/32*
U.S. Cl. 260—92.8 W 6 Claims

Process comprising mixing a vinyl chloride polymer latex with vinyl chloride, destroying the latex emulsifying agent which is of the acid salt type, so that the polymer particles pass into the vinyl chloride and polymerizing the latter, preferably under suspension polymerization conditions.

3,725,376
POLYMERIZATION PROCESS EMPLOYING A POLYMERIZATION INITIATOR FORMED ON ADMIXING A VINYLTIN COMPOUND AND A HALOARYLLITHIUM COMPOUND

William J. Trepka, and Richard J. Sonnenfeld, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 811,579, March 28, 1969, Pat. No. 3,620,963. This application April 8, 1971, Ser. No. 132,619
Int. Cl. C08d *1/20*; C08f *5/00, 7/00*
U.S. Cl. 260—94.3 10 Claims

A polymerization process for the polymerization of conjugated dienes to gel-free polymers of high cis content and relatively low inherent viscosity, and for polymerization of other polymerizable monomers, which employs a polymerization initiator formed on admixing a vinyltin compound and a haloaryllithium compound selected from 3-halophenyllithium, 1-halo-3-naphthyllithium, 3-halo-1-naphthyllithium, milled 4-halophenyllithium, and milled 4-halonaphtyllithium.

3,725,377
PROCESS FOR POLYMERIZING 1-3-BUTADIENE MONOMER

John E. Cottle, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 552,441, Jan. 24, 1966, abandoned. This application May 11, 1970, Ser. No. 37,410
Int. Cl. C08d *3/06, 5/00*
U.S. Cl. 260—94.2 R 1 Claim

A process for polymerizing of monomers containing ethylenic unsaturation including contacting the polymerization feed stock stream with an adsorbent material, and periodically regenerating the adsorbent material with purified separated nonpolymerizable hydrocarbons separated from the feed stock stream after effectuation of the polymerization step.

3,725,378
POLYMERIZATION OF ETHYLENE

John M. Chamberlin, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 721,212, April 15, 1968, abandoned, which is a continuation of Ser. No. 780,953, Dec. 17, 1958, abandoned. This application Jan. 29, 1971, Ser. No. 111,131
Int. Cl. C08f *1/60, 3/04*
U.S. Cl. 260—94.9 R 10 Claims

A continuous process for producing ethylene polymers by conducting the polymerization of an ethylene feed material at elevated pressures and temperatures in a tubular reactor in the presence of a free-radical initiator for the polymerization and injecting the ethylene feed material containing initiator at a point or points along the length of the tubular reactor while it is simultaneously introduced at the reactor inlet.

3,725,379
CATALYST COMPOSITION AND PROCESS OF POLYMERIZING ETHYLENE WITH SAME

Rudolf H. Gaeth, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 755,808, Aug. 28, 1968, abandoned. This application March 18, 1971, Ser. No. 125,849
Int. Cl. C08f *1/56, 13/04*
U.S. Cl. 260—94.9 E 3 Claims

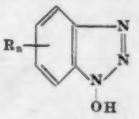
A rubbery polymer having properties of ethylene/propylene rubber is produced by contacting ethylene with a catalyst comprising (1) a nickel-containing compound; (2) an organoaluminum halide; and (3) a complex molybdenum compound.

3,725,380
METHOD OF SYNTHESIZING PEPTIDES IN THE PRESENCE OF A CARBODIIMIDE AND A 1-HYDROXY-BENZOTRIAZOLE

Wolfgang Konig, Langenhain/Taunus, and Rolf Geiger, Frankfurt/Main, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning, Frankfurt am Main, Germany

Filed April 1, 1970, Ser. No. 24,844
Claims priority, application Germany, April 5, 1969, P 19 17 690.0; July 24, 1969, P 19 36 656.8
Int. Cl. C07c *103/52*
U.S. Cl. 260—112.5 5 Claims

Improved synthesis of peptides by the carbodiimide method in which an amino-protected amino acid or peptide having a reactive carboxy group is condensed with a carboxy-protected amino acid or peptide having a reactive amino group in the presence of a 1-hydroxy-benzotriazole or a substituted 1-hydroxy-benzotriazole of the formula



as well as in the presence of a carbodiimide such as dicyclohexyl carbodiimide.

3,725,381
PROCESS FOR PREPARATION OF OVER-BASED SULFURIZED PHENATES

Yoshinori Sakai, Omiya, and Takashi Hori, Soka, both of Japan, assignors to Maruzen Oil Company, Limited, Minami-ku, Osaka, Japan

Filed June 19, 1970, Ser. No. 47,703
Int. Cl. C07c *161/00*
U.S. Cl. 260—137 27 Claims

A process for the preparation of an over-based sulfurized phenate which comprises the steps of heating a mixture of a phenolic compound, elementary sulfur, an alkaline earth metal reagent such as an oxide of a hydroxide of an alkaline earth metal, and a dihydric alcohol at a temperature of from 110° to 200°C in the presence of a higher alcohol as solvent, wherein the weight ratio of the higher alcohol to the phenolic compound is at least 0.5, preferably at least 3.0, to thereby effect sulfurization and metal addition in parallel, distilling the reaction mixture at a temperature below 200°C to remove water formed in the reactions together with a major portion of any unreacted dihydric alcohol, and heating the reaction product contained in the distillation residue together with carbon dioxide at a temperature of from 70° to 200°C in the presence of the higher alcohol, wherein the weight ratio of the higher alcohol to the phenolic compound is at least 10.5, is disclosed.

3,725,382
DIFLUOROPYRIMIDYLAMINO-GROUP-CONTAINING METALLIZED WATER-SOLUBLE REACTIVE FORMAZANE DYES

Philippe Grandjean, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed March 26, 1970, Ser. No. 23,024
Claims priority, application Switzerland, March 26, 1969, 4656/69; April 1, 1969, 4927/69
Int. Cl. C09b *45/18, 62/24*; D06p *1/38*
U.S. Cl. 260—146 D 5 Claims

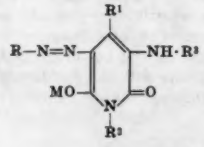
Metal complexes of reactive water-soluble formazane dyes which contain 2, 3 or 4 sulfonic acid groups and one difluoropyrimidylamino group yield dyeings which have good fastness to light, washing, milling and perspiration.

3,725,383
2-HYDROXY-PYRID-6-ONE AZO DYESTUFFS CONTAINING A CELLULOSE FIBER REACTIVE SUBSTITUENT

Peter William Austin; Allen Crabtree; John Lindley Leng; Denis Robert Annesley Ridyard, and Elliott Young, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 20, 1971, Ser. No. 145,505
Claims priority, application Great Britain, July 10, 1970, 33,634/70
Int. Cl. C09b *29/36, 62/08, 62/24*
U.S. Cl. 260—146 T 4 Claims

Azo dyestuffs of the general formula:



(1)

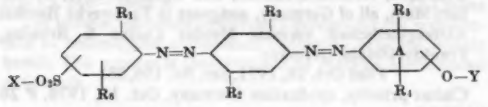
wherein R represents an aromatic radical which may contain one or more further azo groups, M represents H or a metal atom forming part of a metal-complex system in the dyestuff, R^1 represents an alkyl group or a phenyl radical which may be substituted, e.g., by lower alkyl, lower alkoxy or chlorine, R^2 represents a hydrogen atom, an alkyl, aralkyl or cycloalkyl group or a phenyl radical which may be substituted, e.g., by lower alkyl, lower alkoxy or halogen, and R^3 represents a hydrogen atom, a heterocyclic radical containing a cellulose-reactive substituent, or the acyl radical of an organic carboxylic or sulphonic acid which may or may not contain a cellulose-reactive substituent are valuable dyestuffs for a variety of substrates. For example those containing SO_2H groups and a fiber-reactive group are valuable for dyeing and printing of cellulose polyamide and wool textile materials while those which are free from complex metal groups and sulphonic acid groups may be used as disperse dyestuffs.

3,725,384
SUBSTITUTED PHENYL-AZO-PHENYL-AZO-PHENYL COMPOUNDS

Christian Zickendraht, Binningen, and Alfred Fasciati, Bottmingen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed April 10, 1970, Ser. No. 27,458
Claims priority, application Switzerland, April 17, 1969, 5821/69
Int. Cl. C09b *31/02*
U.S. Cl. 260—186 8 Claims

Disazo compounds of the formula



(1)

in which R_1 and R_6 each represents a hydrogen or a halogen atom or a nitro, alkyl or alkoxy group, R_2, R_3, R_4 and R_5 each represents a hydrogen atom or an alkyl or alkoxy group, X represents an amino group bound to the $—SO_2$ bridge by way of its nitrogen atom and Y represents an alkyl group or a group of the formula $B—SO_2—$, in which B represents a low-molecular alkyl group or a benzene residue and in which the benzene ring A can be fused to another benzene ring and the Y—O group is in ortho- or para-position to the azo bridge, are valuable dyestuffs suitable for the spin-coloration of cellulose esters.

3,725,385
PROCESS FOR THE DEMETHYLATION OF 3-AMINO MACROLIDES

Leslie Alan Freiberg, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 2, 1970, Ser. No. 86,314
Int. Cl. C07c *129/18*
U.S. Cl. 260—210 AB 6 Claims

The 3-dimethyl amino substituent of the desosamine and mycaminose moieties of macrolide antibiotics are mono- and didemethylated by reaction with halogen, preferably iodine, in the presence of base at a controlled pH. The resulting compounds have antibiotic activity, and furthermore are useful as intermediates for alkylation and the like.

3,725,386
METHOD FOR PURIFYING CRUDE, DRY GRANULAR REACTED COLD WATER SWELLING HYDROXYPROPYL STARCH DERIVATIVES

Cleo E. Hanson, and John V. Tuschhoff, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 32,341, April 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 696,149, Jan. 8, 1968, abandoned. This application Dec. 6, 1971, Ser. No. 205,299
Int. Cl. C08b *19/06*
U.S. Cl. 260—233.3 R 5 Claims

A method of purifying crude, cold water swelling hydroxypropylated starch derivatives prepared by reacting propylene oxide directly with granular starch in the presence of a polybasic, water soluble salt of phosphoric acid catalyst, and in the absence of any liquid reaction medium by washing the crude reacted product with a water-alcohol mixture, the water being present in the water-alcohol mixture in a weight ratio of between 0.1 to 0.7 parts per part of alcohol. The method removes the overreacted-highly substituted starch fractions which are not approved for food use, and other by-products which would otherwise limit the use of the crude product in food.

3,725,387
AMINOETHYLATION OF FLOUR AND STARCH WITH ETHYLENIMINE

Jack C. McClendon, and Elton L. Berry, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed April 21, 1971, Ser. No. 136,219
Int. Cl. C08b *19/04*
U.S. Cl. 260—233.3 R 12 Claims

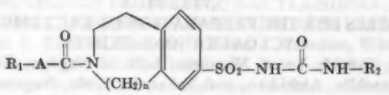
Aminoethylated farinaceous materials, e.g., aminoethylated flours and starches, are prepared in the novel process comprising the steps of (A) contacting (1) ethylenimine in the vapor phase with (2) a farinaceous material(s) at a temperature below the dew point of the ethylenimine vapor, and (B) thereafter heating the reaction mixture to a temperature sufficient to cause reaction between (1) and (2). In a preferred embodiment, the reaction mixture from step (A) is maintained at a temperature below the boiling point of ethylenimine until the temperature exotherm which is observed reaches a maximum before heating the mixture (as per Step B). The aminoethylated products produced by the above process are novel products having utility, for example, as pigment binders and dry strength additives in paper.

3,725,388
N-ACYL-7-(N''-CYCLOALKYL-UREIDO-N'-SULFONYL)-ISOQUINOLINES AND -BENZAZEPINES AND ALKALI METAL SALTS THEREOF

Wolfgang Grell; Gerhart Griss; Manfred Kleemann, and Eberhard Kutter, all of Biberach/Riss, Germany, assignors to Boehringer Ingelheim G. m. b. H., Ingelheim/Rhein, Germany

Filed June 25, 1970, Ser. No. 49,930
Int. Cl. C07d *35/42*, *41/08*
U.S. Cl. 260—239 BB 8 Claims

Compounds of the formula



wherein

R_1 is straight or branched alkyl of one to four carbon atoms, phenyl, alkoxy of one to three carbon atoms — phenyl, tolyl, trifluoromethyl-phenyl, monohalo-phenyl, dihalophenyl, 2-methoxy-5-chlorophenyl, diphenyl, α-naphthyl, 1,2,3,4-tetrahydronaphthyl-(1), indanyl-(1) or benzoyl,

R_2 is n-butyl, cycloalkyl of five to eight carbon atoms, alkyl of one to two carbon atoms — cycloalkyl of five to eight carbon atoms, or adamantyl-(1),

A is a carbon-to-carbon bond, alkylene of one to five carbon atoms or phenyl-alkylene of one to five carbon atoms, and

n is 1 or 2,

as well as alkali metal and alkaline earth metal salts thereof; the compounds and their salts are useful as hypoglycemics in warm-blooded animals.

3,725,389
ADDUCTS OF DELTA-AMINOBENZYLPENICILLIN AND N-SUBSTITUTED-4-PIPERIDONES

Ronald J. McCaully, Malvern; Stanley C. Bell, Penn Valley, and George L. Conklin, Havertown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed July 2, 1971, Ser. No. 159,573
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 7 Claims

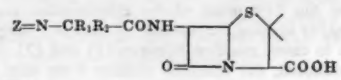
6-(Substituted-1,3,8-triazaspiro[4.5]decan-1-yl) penicillanic acids are described which exhibit antibacterial properties and whose solubility characteristics can be readily altered to permit wider versatility in their use as antibacterial agents.

3,725,390
6-AMINOPENICILLANIC ACID DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

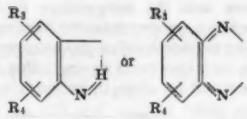
Werner Rogalski; Rochus Jonas; Helmut Wahlig, and Rolf Bergmann, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Germany

Filed July 23, 1971, Ser. No. 165,311
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 **54 Claims**

6-Aminopenicillanic acids of the formula



wherein Z is



in which R_1 is H, alkyl of one to four carbon atoms, or $COOR_5$, and R_2 and R_3 each are H or alkyl of one to four carbon atoms, and R_3 and R_4 each are H, alkyl or alkoxy of respectively one to four carbon atoms, OH, F, Cl, Br, I, CF_3, NO_2 or NH_2, including the physiologically acceptable salts thereof, possess the antibiotic activity of conventional penicillins, e.g., against penicillin sensitive microorganism, e.g., S. aureus, S. pyogenes, Pasteurella cuniculicida and E. coli, and possess substantially higher acid stability.

3,725,391
PROCESS FOR THE PREPARATION OF LACTAMS FROM CYCLOALKANONE OXIMES

Seiya Suzuki; Yasuo Mizuhata, both of Nagoya; Kunihiko Kinoshita, Aichi-ken, and Takanobu Godo, Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 809,954, March 24, 1969, abandoned. This application Nov. 30, 1970, Ser. No. 93,870
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 A **6 Claims**

A process for the preparation of lactams from cycloalkanone oximes by neutralizing the rearrangement reaction products obtained by subjecting cycloalkanone oximes to the Beckman-rearrangement with sulfuric acid or oleum, with an oxide of magnesium or zinc to thereby separate and recover the desired lactams, wherein the formation of ammonium sulfate as a by-product can be prevented; the recovery and reuse of the neutralizing agents can be advantageously and easily performed with respect to operational steps and operational equipment; the lactams of high purity can be obtained in high yields by simple separation and recovery operations; and occurrence of disadvantageous side reactions during the rearrangement and neutralizing steps can be advantageously prevented.

3,725,392
20,21-ACETONIDES OF PREGNENES, 16β-ALKYL-17α,20,21-TRIHYDROXY PREGNENES, AND PROCESS FOR THE PRODUCTION THEREOF

Philip F. Beal, Kalamazoo, and Kenneth P. Shephard, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed April 23, 1971, Ser. No. 137,051
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 D **18 Claims**

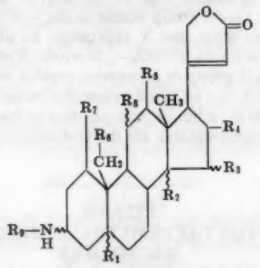
This invention relates to novel 20,21-acetonides of pregnenes and novel 16β-alkyl-17α,20,21-trihydroxy pregnenes, and processes for the production thereof. The compounds of this invention are useful intermediates; they provide an improved means for obtaining valuable 9α-fluoro-16β-alkylprednisolones and their 21-acylates which are known and highly active anti-inflammatory agents, for example, 9α-fluoro-16β-methylprednisolone (Betamethasone).

3,725,393
3-N-ALKYL-AMINO-CARDENOLIDES AND PROCESS FOR THEIR MANUFACTURE

Ulrich Stache, Hofheim/Taunus; Werner Fritsch, Neuenhain/Taunus; Werner Haede, Hofheim/Taunus; Kurt Radscheit, Kelkheim/Taunus, and Ernst Lindner, Frankfurt/Main, all of Germany, assignors to Farbwerke Hoeshst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Oct. 18, 1971, Ser. No. 190,281
Claims priority, application Germany, Oct. 19, 1970, P 20 51 204.3
Int. Cl. C07c *173/02*
U.S. Cl. 260—239.57 **14 Claims**

3-N-alkyl-amino-cardenolides of the general formula



in which R_1 represent hydrogen or β-hydroxy; R_2 and R_3 each represents hydrogen or hydroxy, or R_2 and R_3 together represent a further C-C bond or an α- or β-oxido group; R_4, R_5, R_6 and R_7 each represent hydrogen or a hydroxy group which may be esterified — the OH-group for R_6 may also be etherified —; R_8 represents hydrogen or hydroxy; and R_9 represents an alkyl group with one to six carbon atoms which may contain one or several OH-groups, or an araliphatic radical, and the salts thereof with inorganic or organic acids. The compounds have valuable pharmacological properties, especially a positive or negative inotropic action, and a substantially improved solubility in lipids.

3,725,394
METHYLENE-DITHIOLANS

Alain Donche, Lescar; Claude Thibault, Pau; Emmanuel Arretz, Pau, and Alain Pfister, Pau, all of France, assignors to Societe Nationale des Petroles D'Aquitaine, Courbevoie, France

Filed June 23, 1969, Ser. No. 835,772
Claims priority, application France, June 25, 1968, 68156451
Int. Cl. C07d *71/00*
U.S. Cl. 260—240 F **9 Claims**

The present invention relates to the preparation of methylene-dithiolans able to carry various substitutions on their carbons and more especially on the carbon connected by the double methylenic bond to that of position 2.

Dithiolans are heterocyclic compounds containing 2 atoms of sulphur in a cycle having 5 elements. These substances are useful as sulphurants, for example, for the progressive and controlled sulphuration of metals or other materials. Methylene-dithiolans can, moreover, give rise to various interesting reactions, thanks to their double bond between the carbon in position 2 and a carbon exterior to the cycle.

3,725,395

HETEROCYCLIC COMPOUNDS CONTAINING ETHYLENE DOUBLE BONDS AND PROCESS FOR THEIR MANUFACTURE

Adolf Emil Siegrist, Basel; Peter Liechti, Binningen; Erwin Maeder, Aesch/Bl; Leonardo Guglielmetti, Birsfelden; Hans Rudolf Meyer, and Kurt Weber, both of Basel, all of Switzerland, assignors to Ciba-Geigy A.G., Basel, Switzerland

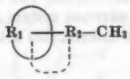
Continuation of Ser. No. 588,318, Oct. 21, 1966, abandoned. This application Aug. 28, 1970, Ser. No. 68,012

Claims priority, application Switzerland, Oct. 28, 1965, 14902/65

Int. Cl. C09b *23/00*

U.S. Cl. 260—240 CA 11 Claims

The present invention comprises a process for the manufacture of heterocyclic compounds containing ethylene double bonds. This process is characterized by reacting a compound of formula



in which R_1 represents a heterocyclic ring system of aromatic character which (a) contains at least one 5-membered or 6-membered heterocyclic ring with at least one ring nitrogen atom, (b) is free of hydrogen atoms which (1) are bonded to ring nitrogen atoms and (2) which are replaceable by alkali metal, and (c) is bonded to a ring member of R_2 by means of a ring member or has two adjacent ring members in common with two adjacent ring members of R_2, in which R_2 denotes a carbocyclic ring system of aromatic character which contains 6 ring members, and which optionally is condensed with a further aromatic or hydroaromatic ring system, and in which (b) the methyl group shown in the formula is in a p-position to the bond to R_1, is reacted with a Schiff base in the presence of a strongly basic alkali compound, with the reaction medium to be used being dimethylformamide, which is practically anhydrous, except in the case of the use of an alkali hydroxide as the strongly basic alkali compound, in which case the alkali hydroxide may have a water content of up to 25 percent. The products obtained according to this process are valuable fluorescent compounds and useful as optical brighteners.

3,725,396

2,5-DISUBSTITUTED 1,3,4-THIADIAZOLES

Gerald Berkelhammer, Princeton, and Goro Asato, Titusville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 767,004, Oct. 11, 1968, Pat. No. 3,598,830. This application Nov. 25, 1970, Ser. No. 92,908

Int. Cl. C07d *91/62*

U.S. Cl. 260—240 G 7 Claims

This invention relates to novel 5-amino, 5-acetamido and 5-nitro-2-substituted 1,34-thiadiazoles and their derivatives. These compounds are useful as antibacterial or antifungal agents.

3,725,397

METHOD OF PRODUCING 7β-ACYLAMIDO-3-METHYLCEPH-3-EM-4-CARBOXYLIC ACID ESTERS AND CATALYSTS THEREFOR

William Graham, Pinner, and Lewis A. Wetherill, North Wembley, both of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Filed March 10, 1970, Ser. No. 18,284

Claims priority, application Great Britain, Dec. 5, 1969, 59,450/69

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 10 Claims

The invention relates to a process for the preparation of 7β-acylamido-3-methylceph-3-em-4-carboxylic acid esters from compounds of the penicillin type, in particular, 6β-acylamido penicillanic acid 1-oxide esters, in the presence of a catalyst selected from a mono-O-substituted orthophosphoric acid, an 0,0-di(aryl substituted) orthophosphoric acid, a salt or complex formed from a nitrogen base having a pKb of not less than 4 and a mono-0-substituted orthophosphoric acid or an 0,0-di(aryl substituted) orthophosphoric acid. The salt or complex may be formed in situ in the reaction mixture.

3,725,398

PROCESS FOR PREPARING 9-ARYLOXYCARBOCYANINE COMPOUNDS

Frank G. Webster, and Robert C. Taber, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed April 21, 1971, Ser. No. 136,177

Int. Cl. C09b *23/06*

U.S. Cl. 260—240.6 24 Claims

Process for preparing 9-aryloxycarbocyanine dye compounds which comprises reacting a 9-alkylthiocarbocyanine dye compound in the presence of a basic medium with a phenol. The 9-aryloxycarbocyanine dye compounds obtained are useful for the spectral sensitization of silver halide photographic emulsions.

3,725,399

METHOD OF PRODUCING 7β-ACYLAMIDO-3-METHYLCEPH-3-EM-4-CARBOXYLIC ACID ESTERS

Norman V. Ellerton, Harrow; William F. Paradise, Windsor, and Peter E. Sandford, Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Filed March 10, 1970, Ser. No. 18,283

Claims priority, application Great Britain, March 11, 1969, 12,866/69; Sept. 22, 1969, 46,622/69

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 18 Claims

The invention relates to a process for the preparation of 7β-acylamido-3-methylceph-3-em-4-carboxylic acid esters from 6β-acylamido penicillanic acid 1-oxide esters in the presence of catalysts which are salts or complexes of acids with nitrogen bases having a pKb of not less than 4. The salts or complexes may be formed in situ.

3,725,400

PROCESS FOR THE RECOVERY OF HYDROPHILIC ANTIBIOTICS

Walter Voser, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed April 28, 1970, Ser. No. 32,763

Claims priority, application Switzerland, May 13, 1969, 7286/69

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 9 Claims

The isolation of cephalosporin C from solutions containing it in admixture with impurities stemming from the fermentation broth by adsorption on macroporous, non-ionic adsorption resins with large surface.

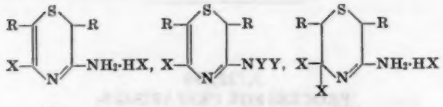
3,725,401

NOVEL 3-AMINO-5-BROMO-2H-1,4-THIAZINES

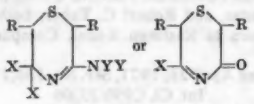
Francis Johnson, Newton Lower Falls, Mass., and Wilmonte A. Nasutavicus, Oakland, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 16, 1968, Ser. No. 762,335
Int. Cl. C07d 93/10
U.S. Cl. 260—243 **17 Claims**

New compounds of the formula



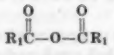
(I) (II) (III)



(IV) (V)

wherein X is chloro, bromo or iodo, R is hydrogen, alkyl, aryl, aralkyl, alkaryl, alkoxyaryl, haloaryl, nitroaryl, cycloalkyl, haloalkyl, nitro, halo, acetamido or lower alkyl carbethoxy, Y is hydrogen, alkarylsulfonyl, arylsulfonyl or

and R_1 is lower alkyl, lower haloalkyl, cycloalkyl, aryl, nitroaryl or haloaryl, are prepared in the novel cyclization reaction (i) comprising reacting a dinitrile of the formula NC—CH(R)—SCH(R)—CN with at least three molar equivalents of HX at a temperature between about −50°C. and about 50°C., or in the reaction (ii) wherein the neutralized reaction product of (i) is further reacted with YX,



or R_2CNO and R_2 is aryl or alkyl or in the reaction (iii) wherein the neutralized reaction product of (i) is further reacted with HBr and an aqueous alcohol solution at reflux temperature. The new compounds are useful as chemical intermediates or in neutralizing acids and as fungicides, herbicides and insecticides.

3,725,402

3-SUBSTITUTED-6-CHLORO-2H-1,3-OXAZINE-2,4(3H)-DIONE

Hans Disselkotter, Cologne, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 13, 1970, Ser. No. 54,660
Claims priority, application Germany, Aug. 8, 1969, P 19 40 368.0
Int. Cl. C07d 87/14
U.S. Cl. 260—244 R **5 Claims**

3-substituted-6-chloro-2H-1,3 oxazine-2,4(3H)-dione are obtained by reacting malonic acid dichloride with an isocyanate in the presence of a catalyst at a temperature of from −70° to −50°C, and removing the hydrogen chloride formed, by heating after the exothermic reaction has abated.

The compounds for instance 6-chloro-3-methyl-2H-1,3-oxazine-2-4(3H)-dione may be used in the production of plant-protection agents or even directly as such for controlling insects and mites.

3,725,403

BENZOTHIAZINE DERIVATIVES

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed Oct. 20, 1970, Ser. No. 82,509
Int. Cl. C07d 93/12
U.S. Cl. 260—243 R **7 Claims**

Disclosed herein are benzothiazines, benzoxazines, indolinones and derivatives thereof. The compounds of the invention possess central nervous system depressant activity as well as anti-bacterial and disinfectant activity.

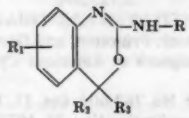
3,725,404

2-AMINO-4,4-DI-SUBSTITUTED-4H-3,1-BENZOXAZINES

Heinz Kuch; Karl Schmitt; Gunther Seidl, and Irmgard Hoffmann, all of Bad Soden, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning, Frankfurt/Main, Germany

Continuation-in-part of Ser. No. 682,631, Nov. 13, 1967, abandoned. This application June 9, 1971, Ser. No. 151,599
Claims priority, application Germany, Nov. 24, 1966, F 50751
Int. Cl. C07d 87/20
U.S. Cl. 260—244 R **15 Claims**

2-Amino-4,4-di-substituted benzoxazine derivatives and the salts thereof with a physiologically compatible acid have an action on the central nervous system. These benzoxazines have the formula



in which R is hydrogen, alkyl of one to four carbon atoms, cyclohexyl, phenyl or benzyl, R_1 is hydrogen, halogen, trifluoromethyl, R_2 is alkyl of one to four carbon atoms and R_3 is phenyl or halophenyl.

3,725,405

2,4,7-TRISUBSTITUTED-[PYRIDO 2,3-D]PYRIMIDINE-6-CARBOXAMIDES

Arthur A. Santilli, Havertown, and Dong H. Kim, Wayne, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed June 18, 1970, Ser. No. 47,571
Int. Cl. C07d 57/20
U.S. Cl. 260—247.2 A **7 Claims**

Novel 2,4,7-trisubstituted-pyrido[2,3-d]pyrimidine-6-carboxamides have been produced which have central nervous system depressant activity and are useful pharmacological agents in the calming of animals.

3,725,406

BENZIMIDAZOLE DERIVATIVES AS FUNGICIDAL ACTIVE COMPOUNDS

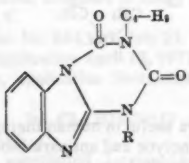
Elaine A. Bose, and Earl R. White, both of Davis, Calif., assignors to The Regents of the University of California, Berkley, Calif.

Continuation-in-part of Ser. No. 172,205, Aug. 16, 1971, abandoned. This application Oct. 12, 1971, Ser. No. 188,499

Int. Cl. C07d 57/34

U.S. Cl. 260—249.5 10 Claims

The method of manufacture, method of use and fungicidal active compounds are described herein. The active compounds have the following formula:



wherein R can be selected from the group consisting of hydrogen, sodium, potassium and ammonium.

3,725,407

6-SUBSTITUTED AMINO-3-NITROIMIDAZO(1,2-B)PYRIDAZINES AND METHODS OF PREPARING THE SAME

Andrew Stephen Tomcufcik, Old Tappan, N.J.; Patrick Thomas Izzo, and Paul Frank Fabio, both of Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed April 8, 1971, Ser. No. 132,565

Int. Cl. C07d 51/04

U.S. Cl. 260—250 A 6 Claims

The preparation of 6-substituted amino-3-nitroimidazo-[1,2-b]pyridazines by reacting a 6-amino or substituted amino-3-nitroimidazo[1,2-b]pyridazine with an acid chloride or acid anhydride, is described. Other methods of preparing 6-substituted amino-3-nitroimidazo[1,2-b]pyridazines are described. The compounds are useful for their antiprotozoal and particularly antitrichomonal and antiamebic activity in warm-blooded animals.

3,725,408

PTERIDINE DERIVATIVES AND METHOD

Hamish C. S. Wood, Glasgow, and Alexander Stuart, Kent, both of England, assignors to The University of Strathclyde, Glasgow, Scotland

Division of Ser. No. 794,786, Jan. 28, 1969, Pat. No. 3,635,978. This application July 6, 1971, Ser. No. 160,216

Int. Cl. C07d 57/28

U.S. Cl. 260—251.5 2 Claims

A compound 2-amino-4-hydroxy-6-hydroxymethyl-7,7-dimethyl-7, 8-dihydropteridine, or tautomeric forms thereof and pharmaceutically acceptable salts thereof. The compound is useful as a bacteriostat and in antibacterial products. The compound has useful activity against C1. perfringens and Derm. dermatonomous.

3,725,409

8-SUBSTITUTED 10-PIPERAZINE-10,11-DIHYDRODIBENZO(B,F) THIEPINES

Miroslav Protiva; Karel Pelz, and Jirina Metysova, all of Praha, Czechoslovakia, assignors to Spofa, United Pharmaceutical Works, Praha, Czechoslovakia

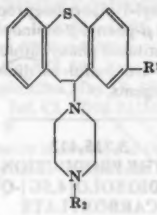
Filed March 23, 1970, Ser. No. 22,074

Claims priority, application Czechoslovakia, March 24, 1969, 2095/69

Int. Cl. C07d 51/70

U.S. Cl. 260—268 TR 3 Claims

8-substituted 10-piperazino-10,11-dihydrodibenzo (*b,f*) thiepines having the formula



(I)

wherein R^1 is alkyl, alkoxy, alkylthio having one to four carbon atoms, or trifluoromethyl, R^2 is hydrogen or hydroxyalkyl having two to four carbon atoms, and the pharmaceutically acceptable salts thereof having valuable pharmacodynamic activity and being suitable for use as neuro- and psychotropic medicaments.

3,725,410

3-AMINOMETHYL-3-QUINUCLIDINOLS

John R. Potoski, Rosemont, and Meier E. Freed, Paoli, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed July 15, 1970, Ser. No. 55,264

Int. Cl. C07d 51/70, 51/72

U.S. Cl. 260—268 BC 3 Claims

This invention is concerned with new and novel derivatives of 3-aminomethyl-3-quinuclidinols which are pharmacologically active as CNS depressants useful in the calming of animals. Further, this invention is concerned with methods of producing the new and novel 3-aminomethyl-3-quinuclidinols. Still further, this invention is concerned with 3-methylenequinuclidine oxide which is a new and novel intermediate useful in the production of the new and novel 3-aminomethyl-3-quinuclidinol derivatives of the present invention.

3,725,411

[4-(10,11-DIHYDRODIBENZ[B,F]OXEPIN-10-YL)-1-PIPERAZINYL]-ALKYL]-3-ALKYL-2-IMIDAZOLIDINONES AS CNS-DEPRESSANTS

Walter Schindler, Riehen/Basiland; Erich Schmid, Basle, and Armin Zuest, Birsfelden/Basiland, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,509

Claims priority, application Switzerland, Aug. 11, 1969, 12124/69

Int. Cl. C07d 51/70

U.S. Cl. 260—268 TR 2 Claims

Compounds of the class of 1-[2- or 3-[4-(10,11-dihydrodibenz[b,f]]-alkyl]-3-alkyl-2-imidazolidinone, which can be substituted in 8-position by chloro, methyl or methoxy, and the pharmaceutically acceptable acid addition of salts thereof, have a depressant effect on the central nervous system; pharmaceutical compositions comprising these compounds and a method of producing a depressant effect on the central nervous system of warm-blooded animals are provided.

An illustrative embodiment is 1-[3-[4-(8-chloro-10,11-dihydrodibenz[b,f]]-propyl]-3-methyl-2-imidazolidinone.

3,725,412

SUBSTITUTED α,α,γ-TRIPHENYL-AMINOPROPANOLS

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Parsippany, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Filed Dec. 29, 1969, Ser. No. 888,873
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 BZ **2 Claims**

Substituted α, α, γ-triphenyl-aminopropanols, e.g., 4-methyl-α, α, γ-triphenyl-1-piperazinepropanol, are prepared by treating substituted β-phenyl-β-aminopropiophenones with phenyl lithium or substituted phenyl lithium compounds. The compounds obtained are useful as diuretics and hypotensive/antihypertensive agents.

3,725,413

PROCESS FOR THE PRODUCTION OF ETHYL 8-HYDROXY-1,3-DIOXOLO[4,5G]-QUINOLINE-7-CARBOXYLATE

Jerome Genzer, Livingston, and George Conrad, Irvington, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 164,451, July 20, 1971, abandoned. This application Jan. 17, 1972, Ser. No. 218,504
Int. Cl. L07d *33/48*
U.S. Cl. 260—287 R **4 Claims**

A process for the production of ethyl 8-hydroxy-1,3-dioxolo[4,5g]-quinoline-7-carboxylate is disclosed. This process comprises reacting ethyl alcohol with phosphorous pentoxide under carefully controlled temperature conditions using xylene as the vehicle. To this reaction mixture is added diethyl (3,4-methylenedioxyphenyl)-aminomethylenemalonate which is then heated at 138° to 140° C. for about 60 minutes to produce the desired product. Ethyl 8-hydroxy 1,3-dioxolo[4,5g]-quinoline-7-carboxylate is useful as an intermediate for the production of oxolinic acid.

3,725,414

MANUFACTURE OF HALOGENATED PYRIDINE DERIVATIVES

Roy Dennis Bowden, and Thomas Seaton, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 16, 1971, Ser. No. 172,266
Claims priority, application Great Britain, May 4, 1971, 12,902/71; Aug. 19, 1970, 39,394/70
Int. Cl. C07d *31/26*
U.S. Cl. 260—290 HL **7 Claims**

A process for the manufacture of a chloropyridine which comprises interacting -caprolactam with chlorine in the vapor phase at a temperature of at least 250°C.

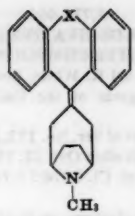
3,725,415

3-TROPANYLIDINE DERIVATIVES OF TRICYCLIC COMPOUNDS, THEIR SALTS, AND PROCESS OF PREPARATION

Jacques R. Boissier, Paris, and Roger Ratouis, Saint-Cloud, both of France, assignors to Societe anonyme dite: Societe Industrielle pour La Fabrication des Antibiotiques (S.I.F.A), Puteaux, France

Filed Oct. 21, 1969, Ser. No. 868,230
Claims priority, application France, Oct. 22, 1968, P.V. 170 767; Dec. 20, 1968, 68179397
Int. Cl. C07d *43/06*
U.S. Cl. 260—292 **2 Claims**

Tropane derivatives and acid addition and quaternary ammonium salts thereof, said tropane derivatives having the formula:



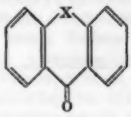
(1)

in which X represents: —CH_2—CH_2—, —CH=CH—,

and —CH_2—S— .

These products are useful in human therapeutics namely as antihistaminic, spasmolytic and antiparkinson medicines.

Compounds of formula 1 are prepared by reacting the organo-magnesium compound of 3β-chlorotropane with a ketone of formula:



(2)

hydrolyzing with water and resulting magnesium complex and reacting the obtained compound with a dehydrating agent (acetic anhydrid or phosphorous oxychloride or hydrochloric acid).

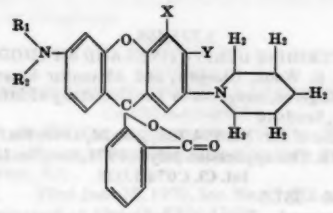
3,725,416

7-PIPERIDINOFLUORAN

Kenji Yamamoto, Fujiidera; Nobuharu Sasaki, Higashiosaka, and Mutsuo Terayama, Yuge, all of Japan, assignors to Yamamoto Kagaku Gosei Co., Ltd., Yuge, Yao, Japan

Filed Nov. 30, 1970, Ser. No. 93,897
Claims priority, application Japan, Dec. 5, 1969, 44/98034
Int. Cl. C07d *29/12*
U.S. Cl. 260—293.58 **7 Claims**

Compounds and a pressure-sensitive copying sheet containing said compounds as a color-forming agent art provided said compounds have the following general formula:



wherein each of R_1 and R_2 is independently alkyl of up to 4 carbon atoms; and each of X and Y is independently hydrogen, halogen of alkyl of up to 4 carbon atoms.

3,725,417

CARBOXAMIDOBENZOIC ACIDS AS HYPOLIPEMIC AGENTS

Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 2, 1971, Ser. No. 194,922
Int. Cl. C07d 29/22
U.S. Cl. 260—293.77 8 Claims

2-Substituted-5-carboxamidobenzoic acids and the pharmaceutically acceptable salts thereof as hypolipemic agents.

3,725,418

1-PIPERIDINE-1-CYANO-O-CARBAMOYL-FORMOXIMES

Hans Ulrich Brechbuhler, Basel, and Kurt Gubler, Riehen, both of Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 844,163, July 23, 1969, Pat. No. 3,673,236. This application April 13, 1972, Ser. No. 243,847
Claims priority, application Switzerland, July 24, 1968, 11105/68
Int. Cl. C07d 29/32
U.S. Cl. 260—293.86 2 Claims

New basically substituted 1-cyano-O-carbamoyl-formoximes are described as insecticides, acaricides and nematocides, which are distinguished from known carbamoyl-oximes by pronounced systemic insecticidal, acaricidal and nematocidal action. A typical compound is 1-diethylamino-O-(N'-methylcarbamoyl)-formoxime. Processes for the production of these compounds are described as well as pesticidal compositions containing these compounds as active substances.

3,725,419

QUINUCLIDYLALKYL ESTERS

Claude I. Judd, Mequon, and Wallace K. Hoya, Milwaukee, both of Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 18, 1965, Ser. No. 481,446
Int. Cl. C07d 39/06
U.S. Cl. 260—293.53 8 Claims

The compounds are quinuclidylalkyl esters which are useful as chemical intermediates and possess an anti-Parkinsonism activity. A representative compound is 2-quinuclidylmethyl phenylcyclopentylglycolate.

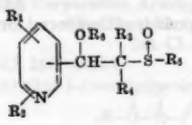
3,725,420

PYRIDYL-β-HYDROXYSULFOXIDES AND SULFONES AND DERIVATIVES

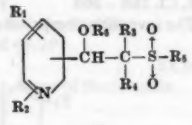
Glenn C. Morrison, Dover; John Shavel, Jr., Mendham, and Wiaczeslaw Cetenko, Parsippany, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sept. 28, 1970, Ser. No. 76,288
Int. Cl. C07d 31/50
U.S. Cl. 260—294.8 F 5 Claims

The present invention relates to pyridyl-β-hydroxy sulfoxides and sulfones having structural formulas:



I



II

wherein R_1 and R_2 are hydrogen, lower alkyl, cycloalkyl, lower alkenyl, aryl, substituted aryl, aralkyl, substituted aralkyl, heterocyclic, substituted heterocyclic, acyl, halogen, lower alkoxy, nitro, mercapto, lower alkylthio, hydroxy, amino, lower alkylamino, dilower alkylamino and the like. R_3 and R_4 are hydrogen, lower alkyl or aryl. R_5 is alkyl up to 12 carbon atoms, aryl, substituted aryl, heterocyclic or substituted heterocyclic. R_6 is alkyl of up to 12 carbon atoms or acyl When R_6 is hydrogen these compounds are prepared by treating a di alkylsulfoxide or sulfone with a pyridine aldehyde. They can also be prepared by reducing a pyridyl-β-ketosulfoxide, or sulfone, with an alkali metal borohydride. These compounds are useful as immunosuppressive agents.

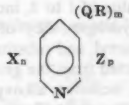
3,725,421

(THIO-, SULFINYL- AND SULFONYL) CONTAINING PYRIDINE COMPOUNDS

Penelope B. Domenico, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 861,506, Sept. 26, 1969, Pat. No. 3,639,413. This application May 17, 1971, Ser. No. 144,330
Int. Cl. C07d 31/50
U.S. Cl. 260—294.8 F 6 Claims

The present disclosure is directed to (thio-, sulfinyl- and sulfonyl) containing pyridine compounds corresponding to the formula



wherein R represents hydrogen, alkyl, monohaloloweralkyl, alkenyl, monohaloalkenyl, cycloalkyl, monohalocycloalkyl, phenyl, aralkyl, alkaryl or monohalophenyl; Q represents sulfide (—S—), sulfinyl

or sulfonyl

; each X independently represents chlorine, bromine or fluorine; Z represents one of cyano (—CN), carbamoyl (—$CONH_2$) or carboxy (—COOH) or the salts thereof; *n* represents an integer of 0 to 3, inclusive; *m* represents an integer of 1 to 3, inclusive; *p* represents an integer of 1 or 2 and the sum of *n*+*m*+*p* equals an integer of 2 to 5, inclusive, with the proviso that when Q is other than sulfide (—S—), R is other than hydrogen and when R is H, *m* is not greater than 2. The preparation of these compounds and their utility as pesticides is also taught.

3,725,422

NEW ORGANIC SULFUR COMPOUNDS AND METHODS FOR THEIR PRODUCTION

David B. Capps, Ann Arbor, Mich., and Alexander Erdelyi, Vaucluse, New South Wales, Australia, assignors to Parke, Davis & Company,, Detroit, Mich.

Filed Sept. 7, 1971, Ser. No. 178,469
Int. Cl. C07d 31/50
U.S. Cl. 260—294.8 E 9 Claims

1-Carboxyalkyl esters of 5-chlorodithio-2-pyridinecarbamic acid; and salts and lower alkyl esters of those 1-carboxyalkyl esters. The compounds are antiparasitic agents having ne-

matocidal activity and antifungal activity against various species. They can be produced by reacting a tertiary amine salt of 5-chlorodithio-2-pyridinecarbamic acid with a haloalkanoic acid salt or haloalkanoic acid ester. The tertiary amine salts of 5-chlorodithio-2-pyridinecarbamic acid can be produced by reacting 2-amino-5-chloropyridine with carbon disulfide and a tertiary amine.

3,725,423

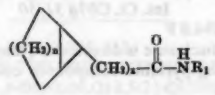
EXO-BICYCLOALKANE CARBOXAMIDES

Ronald H. Rynbrandt, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 14, 1971, Ser. No. 106,603
Int. Cl. C07d *31/41*; C07c *103/19*
U.S. Cl. 260—295 K **2 Claims**

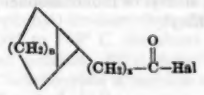
Exo-bicycloalkane carboxamides of the formula II:

II



wherein *n* has the value of 1 to 3, inclusive; wherein *x* is zero or 1; wherein R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, inclusive, 2-pyridyl, phenyl, and substituted phenyl in which the substituents are selected from the group consisting of alkyl of 1 to 3 carbon atoms, inclusive, alkoxy of 1 to 3 carbon atoms, inclusive, halogen, nitro, and trifluoromethyl, are produced by reacting formyl or acetyl exo-bicycloalkane halide of the formula I

I



wherein *n* and *x* are defined as above, and Hal is chlorine or bromine, with an amine $H_2N—R_1$ in which R_1 is defined as above. Compounds II have antidiabetic activity and can be used in mammals to treat hyperglycemia.

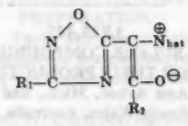
3,725,424

3,5-SUBSTITUTED-1,2,4-OXADIAZOLE INNER QUATERNARY AMMONIUM SALTS

Anne Mary Von Esch, North Chicago, and Aldo Joseph Crovetti, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 30, 1970, Ser. No. 85,747
Int. Cl. C07d *31/42*
U.S. Cl. 260—296 R **4 Claims**

New antimicrobial agents of the formula



where R_1 includes halophenyl, loweralkyl, phenyl, nitrophenyl, dinitrophenyl, nitrofuryl, and nitrothienyl; R_2 includes hydrogen and loweralkyl; and N_{het} includes a heterocyclic moiety bonded through a nitrogen thereof which is sufficiently basic to form quaternary ammonium salts.

3,725,425

1,4,5,6-TETRAHYDRO-2-ACETOPYRIDINE, ITS SALTS AND BISULPHITE ADDITION PRODUCTS, AND SYNTHESIS THEREOF

Irving R. Hunter, Berkeley, and Mayo K. Walden, El Cerrito, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture

Filed March 29, 1968, Ser. No. 717,399
Int. Cl. C07d *31/32*
U.S. Cl. 260—297 R **4 Claims**

Proline and dihydroxyacetone are reacted in the presence of an alkali metal bisulphite to produce the new compound 1,4,5,6-tetrahydro-2-acetopyridine. This compound, as such, or in the form of its bisulphite complex or its salts, is useful for flavoring bread and other bakery products.

3,725,426

DERIVATIVES OF 2,1-BENZISOTHIAZOLINE

Joseph A. Skorcz, Milwaukee; John T. Suh, and Claude I. Judd, both of Mequon, all of Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 32,461, April 27, 1970, Pat. No. 3,657,238, and a continuation-in-part of Ser. No. 682,974, Nov. 14, 1967, Pat. No. 3,528,989, and a continuation-in-part of Ser. No. 571,967, Aug. 12, 1966, abandoned. This application Nov. 3, 1971, Ser. No. 195,481
Int. Cl. C07d *91/06, 91/10*
U.S. Cl. 260—301 **7 Claims**

The compounds are 2,1-benzisothiazolines substituted in the 3-position which are useful pharmaceutical agents, especially central nervous system stimulants and antihypertensive agents. Compounds disclosed include 1,3-dimethyl-3-(3′-hydroxypropyl)-2,1-benzisothiazoline-2,2-dioxide, 1,3-dimethyl-3-(N-carbethoxy-2′-aminoethyl)-2,1-benzisothiazoline-2,2-dioxide, and 1,3-dimethyl-3-(3′-dimethyl--guanidinopropyl)-2,1-benzisothiazoline-2,2-dioxide.

3,725,427

CERTAIN 2,4-DIMETHYL-5-CARBOXAMIDO-THIAZOLES

William A. Harrison, and Marshall Kulka, both of Guelph, Ontario, Canada, assignors to Uniroyal Ltd., Montreal, Quebec, Canada

Division of Ser. No. 599,734, Dec. 7, 1966, Pat. No. 3,547,917. This application May 1, 1970, Ser. No. 33,921
Int. Cl. C07d *91/32*
U.S. Cl. 260—302 R **3 Claims**

This invention pertains to 2,4-dimethylthiazole-5-carboxamides, which have utility as fungicides and plant growth regulants. These compounds are prepared by the reaction of alpha-halo ketone derivatives with thioamides.

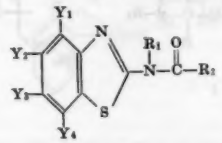
3,725,428

N-BENZOTHIAZOL-2-YL-N′-PROPYLUREAS

Stefan Janiak, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 22, 1969, Ser. No. 868,589
Claims priority, application Switzerland, Nov. 1, 1968, 16333/68
Int. Cl. C07d *91/46*
U.S. Cl. 260—305 **3 Claims**

The invention comprises compounds of the general formula



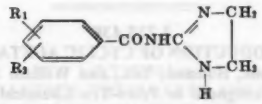
in which Y_1, Y_2, Y_3, Y_4, Y_5, R_1 and R_2 have the meanings given below, their process of manufacture, their use as active ingredients in microbiocidal agents and their methods of use.

3,725,429
BENZAMIDOIMIDAZOLINES

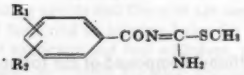
David Maxwell Brown, Dorking, and Eric Alfred Watts, Harlow, both of England, assignors to Beecham Group Limited, Brentford, Middlesex, England

Filed Nov. 12, 1970, Ser. No. 88,978
Claims priority, application Great Britain, Nov. 18, 1969, 56,271/69
Int. Cl. C07d 49/34
U.S. Cl. 260—309.6 2 Claims

Imidazolines having hypotensive and/or anti-inflammatory activity are described. They have the formula:



wherein R_1 and R_2 are the same or different and each is hydrogen, halogen, lower alkyl or lower alkoxy. An imidazoline having hypotensive activity is 2-benzamido-2-imidazoline, an anti-inflammatory imidazoline is 2,4-dichlorobenzamido-2-imidazoline. The new imidazolines are prepared from ethylenediamine and a pseudothiourea or acid addition salt of the formula:



3,725,430
DERIVATIVES OF P-AMINOALKYL BENZENESULFONAMIDES

Henri Dietrich, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,510
Claims priority, application Switzerland, Aug. 8, 1969, 12085/69
Int. Cl. C07d 49/30
U.S. Cl. 260—309.7 6 Claims

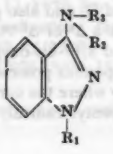
1-(p-Ureidoalkylphenylsulfonyl)-2-imino-imidazolidines and 1-(p-thioureidoalkylphenylsulfonyl)-2-imino-imidazolidines being substituted at the imidazolidine and at the 3-position of the ureido moieties are prepared; these compounds and the pharmaceutically acceptable acid addition salts thereof have hypoglycemic activity; pharmaceutical compositions comprising said compounds and methods of producing hypoglycemic effects in mammals are provided; an illustrative embodiment is 1-[p-(2-(3-n-butyl-2-thioureido)-ethyl)-phenylsulfonyl]-2-imino-3-n-butyl-imidazolidine.

3,725,431
1-ARALKYL-3-AMINOINDAZOLES

Heinz Werner Gschwend, Millburn, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 23, 1970, Ser. No. 74,838
Int. Cl. C07d 49/20
U.S. Cl. 260—310 C 5 Claims

1-Aralkyl-3-aminoindazoles, e.g. those of the formula



R_1 = aralkyl
R_2 = H, alkyl, free, esterified or etherified hydroxyalkyl
R_3 = aza-(alkyl, cycloalkyl-alkyl, aralkyl, alkanoyl, cycloalkyl-alkanoyl or aralkanoyl)

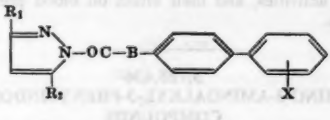
and salts thereof are antiinflammatory agents.

3,725,432
BIPHENYLYL PYRAZOLE COMPOUNDS

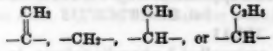
Laszlo Beregi, Boulogne S/Seine; Pierre Hugon, Rueil-Malmaison, and Jean-Claude Le Douarec, Suresnes, all of France, assignors to Societe en Nom Collectif Science Union et Cie, Societe Francaise Medicale, Suresnes, France

Filed June 28, 1971, Ser. No. 157,727
Claims priority, application Great Britain, July 13, 1970, 33,824/70
Int. Cl. C07d 49/18
U.S. Cl. 260—310 R 4 Claims

Pyrazole compounds of the formula



wherein R_1 and R_2 are hydrogen, methyl or ethyl, B is



and X is hydrogen or halogen.

These compounds possess analgesic and anti-inflammatory properties.

3,725,433
CONVERSION OF POLYHALOPHTHALOCYANINES INTO PIGMENTARY FORM

Wolfgang Fabian, Heidelberg; Joachim Franz, Ludwigshafen, and Rudolf Polster, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed May 3, 1971, Ser. No. 139,935
Int. Cl. C09b 47/04
U.S. Cl. 260—314.5 13 Claims

The conversion of metal-free and metalliferous polyhalophthalocyanines into a pigmentary form by treatment of the crude pigment with a sulfuric acid monophenol ester or a reaction product of a phenol which is practically inert to nuclear sulfonation under the reaction conditions with chlorosulfonic acid or oleum. The treatment mixture then has water added to it and it is stirred for cleavage at 80° to 150°C and then aqueous sulfuric acid phase is separated and the pigment is isolated after the addition of an agent having an alkaline reaction so that the phenol passes into solution.

3,725,434
REACTION PRODUCTS OF A POLYALKYLENE AMINE SULFONIC ACID AND AN ALKENYL SUCCINIC ACID OR ANHYDRIDE

John Scotchford Elliott; Ian Robert Henry Crail, and Gerald John Joseph Jayne, all of London, England, assignors to Castrol Limited, London, England

Continuation of Ser. No. 649,102, June 27, 1967, abandoned. This application Jan. 11, 1971, Ser. No. 105,677
Claims priority, application Great Britain, June 28, 1966, 29,050/66
Int. Cl. C07d 27/10
U.S. Cl. 260—326.3 7 Claims

Long chain sulfonated amine compounds having amide or imide linkages are prepared by polymerizing a compound con-

taining a polymerizable aziridine ring with sulfurous acid and reacting the resulting sulfur-containing polyalkylene polyamine with a long chain carboxylic acid, such as, a long chain mono-alkenyl succinic acid or anhydride. The products are useful in lubricating compositions.

3,725,435
2-IMINO-PYRROLIDINES

George Ireland Poos, Ambler, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 738,379, June 17, 1968, abandoned, which is a continuation-in-part of Ser. No. 649,812, June 29, 1967, abandoned, which is a continuation-in-part of Ser. No. 409,563, Nov. 6, 1964, abandoned. This application Nov. 5, 1970, Ser. No. 87,324
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.5 D 21 Claims

The compounds are of the class of 2-imino-pyrrolidines which are useful for their anti-inflammatory and ganglionic blocking activities, and their effect on blood pressure and heart rate.

3,725,436
1-AMINO-3-AMINOALKYL-3-PHENYLINDOLINE COMPOUNDS

Donald E. Butler, 1449 Covington Drive, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 4,127, Jan. 19, 1970, abandoned. This application Aug. 13, 1971, Ser. No. 171,762
Int. Cl. C07d *27/38*
U.S. Cl. 260—326.11 6 Claims

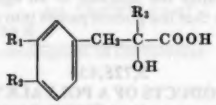
1-Amino-3-aminoalkyl-3-phenylindolines, in which the 1-amino group is substituted by an aralkyl group and by methyl or ethyl and the 3-aminoalkyl group is a dialkylaminoalkyl group or a heterocyclic aminoalkyl group; acid-addition salts thereof; and their production by reacting a 1-amino-3-aminoalkyl-3-phenyloxindole with a reducing agent. The compounds of the invention are useful as pharmacological agents that are active primarily as antidiarrheal agents.

3,725,437
PROCESS FOR THE PREPARATION OF α-HYDROXY-β PHENYPROPIONIC ACID DERIVATIVES AND ALKALIMETAL-OR AMMONIUM SALTS THEREOF

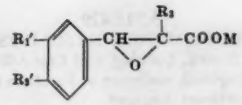
Tsutomu Nagoya, Ashigarashimo-gun; Yoshito Fujima, Kamakura, and Yoichi Shimizu, Yokohama, all of Japan, assignors to Sankyo Chemical Industries Limited

Filed Sept. 16, 1970, Ser. No. 72,903
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 3 Claims

α-Hydroxy-β-phenylpropionic acid derivatives having the formula



wherein R_1 and R_2 represent a hydroxy group or a methoxy group or R_1 and R_2 taken together represent a methylenedioxy group and R_3 represents a hydrogen atom or a methyl group and alkali metal- or ammonium salts thereof which are useful as intermediates for the synthesis of L-α-methyl-β-(3,4-dihydroxyphenyl)-alanine and L-β-(3,4-dihydroxyphenyl)alanine. The propionic acid derivatives and the salts thereof are prepared by subjecting a β-phenylglycidic acid derivative having the formula



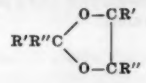
wherein R_1' and R_2' are a benzyloxy group or the same as R_1 and R_2 provided that when R_1 and R_2 are a hydroxy group, R_1' and R_2' represent a benzyloxy group, R_3 is the same as above and M represents an alkali metal or ammonium to a catalytic reduction in the presence of an organic polar solvent such as methanol and acetone.

3,725,438
PRODUCTION OF CYCLIC ACETALS

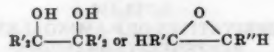
Bruno J. Barone, Houston, Tex., and William F. Brill, Skillman, N.J., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Oct. 16, 1970, Ser. No. 81,554
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 10 Claims

Formation of cyclic acetal compounds of the formula



by reacting a carbonyl compound of the formula R'R''C = O with a second reactant which is



wherein R' and R'' are selected from the group consisting of hydrogen and an acyclic aliphatic hydrocarbon radical in the presence of a catalyst selected from the group consisting of compounds of Periodic Table Groups VB and VIB. For example acetaldehyde is reacted in liquid phase with ethylene oxide in the presence of molybdenum acetyl acetonate to form 2-methyl-1, 3-dioxolane.

3,725,439
13-CARBOCYCLIC-3-KETO-4-GONENES

Arthur A. Patchett, Cranford, and Thomas B. Windholz, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 7, 1971, Ser. No. 104,760
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.4 23 Claims

The invention disclosed herein relates to novel 3,17-bis-oxygenated-gonane compounds having unsaturation in ring A, and a carbocyclic nucleus attached to the C-13 carbon atom, and to the process of preparing these compounds by reacting a 2-carbocyclic substituted cyclopentane 1,3-dione with 6-methoxy-1-vinyl-1-hydroxy-tetrahydronaphthylidene to form a 3-methoxy-13-carbocyclic substituted gona-1,3,5,8(9)-14 pentaen-17-one, followed by reduction, if desired, of the double bonds in rings C and D, and also partial reduction of the aromatic A ring to form a Δ^4 or $\Delta^{8(10)}$ - 3-keto analog. These novel ring A unsaturated 3,17-bis-oxygenated-13-carbocyclic substituted gonane compounds possess antiandrogenic activity, and also, particularly where the carbocyclic nucleus in the 13-position is a cyclopentyl radical, possess anti-progestational action.

3,725,440
SOFTENING AGENT FOR COTTON AND FOR SYNTHETIC TEXTILE SUBSTRATES

James Marvin Brown, Charlotte, N.C., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 583,976, Oct. 3, 1966, Pat. No. 3,509,048. This application March 9, 1970, Ser. No. 17,868

Int. Cl. C07c *143/90;* **C11d** *1/28*

U.S. Cl. 260—400 **1 Claim**

A process for the production of an alkali metal salt of sulfated monoolefinate ester of a polyalkylene poly hydroxy-alcohol-type compound.

3,725,441
ACYLATING AGENTS, THEIR SALTS, AND LUBRICANTS AND FUELS CONTAINING THE SAME

John P. Murphy, Willoughby, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 725,189, April 29, 1968, Pat. No. 3,574,101. This application Aug. 17, 1970, Ser. No. 64,639

Int. Cl. C07c *143/90*

U.S. Cl. 260—400 **13 Claims**

Oil-soluble carboxylic acid acylating agents are prepared by reacting a high molecular weight mono- or polycarboxylic acid with a sulfonating agent. The resulting acylating agents can be converted to acidic, neutral, or basic metal salts. Both the novel acylating agents and the salts are useful additives for lubricants and fuels and as intermediates for the preparation of other useful lubricant and fuel additives, particularly high molecular weight oil-soluble acylated nitrogen compositions and esters. The latter are prepared by reacting the acylating agents with, for example, alkylene polyamines or mono- or polyhydric alcohols.

3,725,442
COPOLYMERS OF VINYL MONOMERS AND POLYESTERS

Carl S. Marvel, and Roberta C. L. Chow, both of Tucson, Ariz., assignors to The United States of America as represented by the Secretary of Agriculture

Division of Ser. No. 793,189, Jan. 22, 1969, Pat. No. 3,640,927. This application April 9, 1970, Ser. No. 31,436

Int. Cl. C07c *69/66;* **C08g** *17/02*

U.S. Cl. 260—405 **2 Claims**

There are disclosed herein addition copolymers of (*a*) a vinyl monomer and (*b*) a polymerizable polyester, for example, an acrylate or a vinyl ester of a polyester of an aliphatic hydroxycarboxylic acid. A typical example is the copolymer of (*a*) vinyl chloride and (*b*) a vinyl ester of a polyester of 10-hydroxydecanoic acid. This copolymer is useful for preparing flexible films.

3,725,443
PROCESS FOR THE PRODUCTION OF AN ALKYLENE BIS-DITHIOCARBAMATE

Shigeki Horlie; Hiroyasu Morikawa, both of Yokohama; Chiyuki Fujii, Yamato; Teruo Kobayashi, Tokyo; Susumu Kohno, Tokyo, and Toru Ono, Tokyo, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

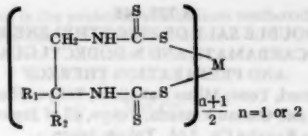
Filed Nov. 12, 1970, Ser. No. 89,079

Claims priority, application Japan, Nov. 11, 1969, 44/89710; Nov. 20, 1969, 44/92482

Int. Cl. C07f *13/00, 15/00, 9/94*

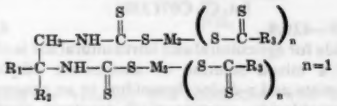
U.S. Cl. 260—429 K **7 Claims**

This invention relates to novel methods for the production of



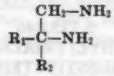
(I)

and



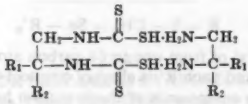
(II)

wherein R_1 and R_2 are hydrogen or alkyl groups, R_3 is a dialkylamino, alkoxy, morphalina or piperidine group, M is a divalent or trivalent metal have fungicidal activity against plant viruses. These compounds are prepared by reacting an a 1,2-alkylene-diamine of the formula:



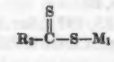
(III)

Compound (V) is reacted with CS_2 to form a 1,2-alkylene-bis-dithiocarbamic acid · 1,2-alkylene diamine addition salt of the formula:



(IV)

Compound (IV) is isolated for purification and is reacted with the appropriate metal ion corresponding to M when compound (I) is being prepared. To prepare compound (II), a mixture of compound (IV) and a dithiocarbamate of the formula:



(V)

is reacted with the appropriate metal ion.

This invention also relates to novel compounds represented by formula (II).

3,725,444
VANADIUM ORGANOMETALLIC COMPOUNDS AND POLYMERIZATION CATALYSTS THEREOF

James R. Huerta, Adrian, and Jeffrey G. Meyer, Chelsea, both of Mich., assignors to Dart Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 846,614, July 31, 1969, Pat. No. 3,595,844. This application Dec. 30, 1970, Ser. No. 102,948

Int. Cl. C07f *9/00*

U.S. Cl. 260—429 K **4 Claims**

The reaction product of a sulfur-containing vanadium salt such as vanadyl sulfate and an organophosphate, such as triethyl phosphate, results in a hydrocarbon soluble catalyst component. This component forms an active vanadium coordination catalyst when combined with an organoaluminum halide. The resulting vanadium coordination catalyst is especially useful in the production of "EP" and "EPDM" rubber.

3,725,445

A DOUBLE SALT OF ZINC ETHYLENE-BIS-DITHIOCARBAMATE AND N-DODECYLGUANIDINE AND PREPARATION THEREOF

Kaoru Ohmori, Yono; Mituo Nakajima, Tokyo; Shuichi Ishida, Ohmiya, and Osamu Yamada, Tokyo, all of Japan, assignors to Nippon Kayaku Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1971, Ser. No. 106,181
Int. Cl. C07f 3/06
U.S. Cl. 260—429.9 4 Claims

A fungicide for agricultural and horticultural use is obtained by adding a mixed solution of ammonium ethylene-bis-dithiocarbamate and n-dodecylguanidine to an aqueous solution of zinc chloride, reacting these reactants together to prepare a double salt of zinc ethylene-bis-dithiocarbamate and n-dodecylguanidine and then mixing therewith auxiliary substances such as extending agent, emulsifier, wetting agent, binding agent, etc. The fungicide is useful as a preparation for controlling diseases of fruit-trees, such as Alternaria leaf spot of apple, and black spot and scab of Japanese pear, etc., and exhibits poor phytotoxicity to plants when compared with n-dodecylguanidine acetate preparations.

3,725,446

(PHENYLTHIOMETHYL) TRIALKYLTIN COMPOUND AND PHENYL SUBSTITUTED DERIVATIVES

Donald J. Peterson, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed March 27, 1970, Ser. No. 23,457
Int. Cl. C07f 7/22; A01m 9/00
U.S. Cl. 260—429.7 7 Claims

Disclosed are novel organotin compounds and a process for preparing same. These organotin compounds correspond to the general formula:

$$R - S - CH_2 - Sn - R'_3$$

where R is alkyl of from one to 14 carbon atom; aryl, or substituted aryl, and each R′ is alkyl of one to 14 carbon atoms. The organotin compounds of the invention having pre-emergent and post-emergent herbicidal activity are employed in the formulation of herbicidal compositions effective for controlling or combating the growth of weeds and other undesirable vegetation.

3,725,447

LEAD FLUOROBORATES AS REDISTRIBUTION CATALYSTS

John C. Shepard, Jr., Freeport, Tex., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Sept. 23, 1971, Ser. No. 183,228
Int. Cl. C07f 7/24
U.S. Cl. 260—437 R 4 Claims

A process for the redistribution of alkyl radicals in tetra alkyl lead compositions by using as a catalyst a trialkyl lead fluoroborate. Also there is shown a new method for preparing trialkyl lead fluoroborates.

3,725,448

PROCESS FOR THE PREPARATION OF CHROMIUM (III) NITRATE COMPLEXES WITH TRANS-ACIDS

Harry Bowman West, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1971, Ser. No. 211,104
Int. Cl. C07f 11/00
U.S. Cl. 260—438.5 R 6 Claims

Stable, concentrated, aqueous solutions of complexes of chromium (III) nitrate with certain carboxylic trans-acids are prepared by heating the trans-acid with chromium (III) nitrate and with an alkali, the ratios of the reactants being 1 gram-atom of chromium to 1.0–1.5 gram-equivalents of alkali to 0.4–0.6 mole of the trans-acid. Solutions of these complexes are useful in the process of fabricating glass-fiber/polyolefin composites, for which the complexes are very good coupling agents.

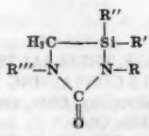
3,725,449

CYCLIC UREA DERIVATIVES AND PROCESS FOR THEIR MANUFACTURE

Hans Dietrich Golitz, Cologne-Stammheim; Rudolf Merten, Leverkusen; Walter Noll, Opladen, and Walter Simmler, Odenthal-Gloebusch, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 16, 1970, Ser. No. 81,515
Claims priority, application Germany, Oct. 29, 1969, P 19 54 447.9
Int. Cl. C07f 7/18; C07d 103/04
U.S. Cl. 260—448.8 R 13 Claims

Novel cyclic urea derivatives containing silicon atoms have the general formula



wherein R is a hydrocarbon radical optionally being interrupted by oxygen atoms in ether linkages, R′ and R″ (same or different) are hydrocarbon radicals, halohydrocaron radicals, cyanohydrocarbon radicals, or alkoxy radicals, and R‴ is a hydrocarbon radical.

3,725,450

PROCESS FOR THE PREPARATION OF ISOCYANATES FROM ACYL AZIDES

Arthur J. Coury, Minneapolis, and Edgar R. Rogier, Hopkins, both of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Oct. 5, 1970, Ser. No. 78,199
Int. Cl. C07c 119/04
U.S. Cl. 260—453 P 9 Claims

Organic acyl azides and isocyanates are prepared from acyl halides and metal azides using acetonitrile in the reaction medium.

3,725,451

SUBSTITUTED BENZOYLHALOALKANESULFONANILIDES

Ronald J. Trancik; Robert A. Scherrer, both of White Bear Lake, and Joseph Kenneth Harrington, Edina, all of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Filed April 13, 1970, Ser. No. 28,020
Int. Cl. C07c 143/74
U.S. Cl. 260—456 A 32 Claims

Benzoylhaloalkanesulfonanilides having ring substituents selected from amino, nitro, carboxyl, mercapto, phenylsulfinyl, phenylsulfonyl, lower alkylsulfonamido, lower alkanoylamino, lower alkylthio, lower alkanoyloxy, lower alkylsulfamoyl, lower alkylsulfonoxy and lower haloalkylsulfonoxy. These compounds and salts thereof are active anti-inflammatory agents and some also have anti-pyretic and analgesic activity.

3,725,452

BENZYL-N-(N-BUTYL) CHLOROPHENOXYTHIOBUTYRIMIDATES

Edmund J. Rumanowski, Denver, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 863,011, Sept. 24, 1969, Pat. No. 3,628,944. This application Aug. 9, 1971, Ser. No. 170,354
Int. Cl. C07c 119/20
U.S. Cl. 260—453 R 3 Claims

Benzyl-N-(n-butyl)-chlorophenoxythiobutyrimidates are prepared by reacting N-(n-butyl)-di- or trichloro-phenoxythiobutyramide with benzyl bromide in the presence of sodium alkylate. The compounds are useful as herbicides.

3,725,453

L-4'-CYANO-3-(2,2,2-TRIHALOACETAMIDO) SUCCINANILIC ACIDS

Milton Lapidus, Rosemont, and Marian M. McGettigan, Bryn Mawr, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 16, 1970, Ser. No. 81,533
Int. Cl. C07c *101/02*, *121/78*
U.S. Cl. 260—465 D 3 Claims

Disclosed herein are derivatives of L-aspartic acid which have utility as artificial sweetener agents. Also disclosed is a method for producing such derivatives.

3,725,454

PROSTANOIC ACID DERIVATIVES

Philip F. Beal, III, and John E. Pike, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 520,876, Jan. 17, 1966, abandoned, which is a continuation-in-part of Ser. No. 480,107, Aug. 16, 1965, abandoned. This application Oct. 16, 1970, Ser. No. 81,595
Int. Cl. C07c *61/36*
U.S. Cl. 260—488 R 6 Claims

15-Hydroxy-9- Oxoprostanoic acid and 15-Hydroxy -9-Oxoprosta-trans-13-enoic acid have been prepared.

3,725,455

PEROXY COMPOUNDS CONTAINING A CARBONATE GROUP

Antonio Joseph D'Angelo, Buffalo; Orville Leonard Magell, and Chester Stephen Sheppard, both of Kenmore, all of N.Y., assignors to Pennwalt Corporation

Filed June 17, 1968, Ser. No. 737,359
Int. Cl. C07c *73/00*; C08f *1/60*
U.S. Cl. 260—463 12 Claims

A new class of compounds: R-W-R ′where R and R ′are identical oxy radicals containing peroxide functions such as dialkyl or diaralkyl peroxide, peroxyketal, peroxyester, or monoperoxycarbonate, and W is a carbonyl group, or carbonyl containing group, or an alkylidene or aralkylidene group, or a phosphorus containing group.

Examples:

Di[1,3-dimethyl-3-(t-butylperoxy)butyl] carbonate;

Di[1,3-dimethyl-3-(n-butoxycarbonylperoxy)butyl] carbonate;

2,2-Bis[3,3-di(t-butylperoxy)butoxy]propane;

Di[1,3-dimethyl-3-(t-butylperoxy)butyl] ethyl phosphate.

They are free radical affording compounds useful in crosslinking of polyolefins and unsaturated polymers, and for the polymerization of vinyl monomers and diolefinic monomers.

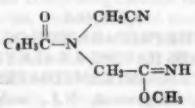
3,725,456

PROCESS FOR PREPARING AMIDINE SALTS

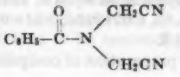
Patricia M. Scanlon, Arlington, Mass., and Elwyn R. Young, Nashua, N.H., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 830,091, June 3, 1969, Pat. No. 3,641,103. This application March 10, 1971, Ser. No. 123,100
Int. Cl. C07c *121/66*
U.S. Cl. 260—465 D 4 Claims

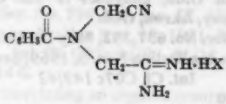
An imidoether having the formula



is prepared by reacting



with methanol in the presence of a sodium methoxide catalyst, and an amidine salt having the formula



is prepared by reacting the imidoether with ammonium chloride or ammonium bromide in the presence of methanol.

3,725,457

PRODUCTION OF ACETONITRILE

Marcel Borrel; Jacques Marion, and Jean Metzger, all of Oullins, France, assignors to Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 819,980, April 28, 1969, abandoned. This application Nov. 3, 1971, Ser. No. 195,514
Claims priority, application France, April 26, 1968, 68149679
Int. Cl. C07c *121/18*, *121/32*
U.S. Cl. 260—465.1 5 Claims

Process for the preferential formation of acetonitrile in vapor phase ammoxidation of acrolein or products producing acrolein by carrying out the reaction at a relatively low temperature and at a high ammonia to acrolein ratio.

3,725,458

PROCESS FOR PREPARING CYANO-COMPOUNDS

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 10,046, Feb. 9, 1970, abandoned. This application Nov. 17, 1971, Ser. No. 199,769
Int. Cl. C07c *121/06*
U.S. Cl. 260—465.1 6 Claims

A process for the preparation of terminally substituted cyano-compounds from 1-alkenes. The process involves the preparation of a 1-bromoalkane from the reaction of the 1-alkene and HBr in the presence of an initiator followed by a catalyzed halogen exchange reaction with HCl wherein a 1-chloroalkane is formed and HBr is regenerated. The 1-chloroalkane is then reacted with a cyanide containing compound in the presence of an organic quaternary salt catalyst to produce the desired terminally substituted cyano-compound, a 1-cyanoalkane.

3,725,459

PROCESS FOR PURIFYING ADIPONITRILE

Keisho Yamada; Kenji Nishimura; Shinichi Furusaki; Tatsuo Toshimitsu, and Yukio Inaba, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube-shi, Yamaguchi-ken, Japan

Filed Aug. 4, 1970, Ser. No. 60,859
Int. Cl. C07c *121/26*
U.S. Cl. 260—465.8 R 5 Claims

A process for purifying crude adiponitrile which comprises contacting crude liquid adiponitrile with oxygen or a gas containing molecular oxygen at a temperature of from 120° to 300°C. to thereby convert impurities in the crude adiponitrile into colored high-boiling compounds, and separating adiponitrile from the colored, high-boiling compounds by distillation under reduced pressure.

3,725,460

REACTION PRODUCTS OF MULTIAZIRIDINO COMPOUNDS AND HYDROGEN SULFIDE

Heinz Uelzmann, Cuyahoga Falls, and David C. Hidinger, Jr., Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 637,352, May 10, 1967, Pat. No. 3,514,369. This application Nov. 3, 1969, Ser. No. 873,683

Int. Cl. C07c *149/42*

U.S. Cl. 260—470 2 Claims

Novel adducts of multiaziridino compounds are prepared by reacting H_2S with multiaziridino compounds. The reaction products, which contain secondary amino and thio groups, may be used to form adhesives, particularly with epoxy compounds, and metal-to-metal laminates.

3,725,461

TEREPHTHALIC BASED UNSATURATED POLYESTERS

Saunders E. Jamison, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

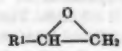
Filed April 13, 1970, Ser. No. 32,497

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 P 1 Claim

A process is disclosed for the preparation of terephthalate based unsaturated polyesters by first reacting a mono unsaturated dicarboxylic acid anhydride having from 4–10 carbon atoms with a terephthalic acid glycol ester having the general formula:

wherein R is C_2 to C_6 alkylene to form a glycol ester-mono unsaturated acid adduct and then reacting this adduct with an oxide having the general formula:



wherein R^1 is H or an organic radical having from one to eight carbon atoms. The resulting polyester is useful in preparing protective coatings and plastics when blended with an ethylenically unsaturated monomer and an addition polymerization initiator system.

3,725,462

PROCESS FOR THE MANUFACTURE OF SUBSTITUTED PHENYL ESTERS AND OPTIONALLY SUBSTITUTED PHENOLS

Manfred Boldt; Hans-Jurgen Arpe, both of Fischbach/Taunus, and Lothar Hornig, Frankfurt/Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Sept. 19, 1968, Ser. No. 760,962

Claims priority, application Germany, Sept. 23, 1967, P 16 43 361.7

Int. Cl. C07c *69/14*

U.S. Cl. 260—479 R 6 Claims

Manufacture of substituted phenyl esters and optionally substituted phenols by reaction of a substituted benzene with an aliphatic or cycloaliphatic carboxylic acid and oxygen in the presence of a noble metal of Group VIII of the Mendeleeff Periodic Table and/or a compound thereof.

3,725,463

PROCESS FOR AROMATIC SUBSTITUTION

Robert E. Robinson, Columbia, S.C., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 809,406, March 21, 1969, Pat. No. 3,578,716, which is a continuation-in-part of Ser. No. 631,917, April 19, 1967, abandoned, which is a continuation-in-part of Ser. Nos. 282,559, May 23, 1963, abandoned, and Ser. No. 282,594, May 23, 1963, abandoned, and Ser. No. 282,595, May 23, 1963, abandoned. This application Jan. 25, 1971, Ser. No. 109,628

Int. Cl. C07c *69/14*

U.S. Cl. 260—479 R 6 Claims

Substituted aromatic derivatives are prepared by reacting an aromatic compound with a Group VIII platinum metal salt wherein the substituent introduced is derived from the anion portion of said Group VIII platinum metal salt.

3,725,464

PROCESS FOR METHOXYETHYL CARBAMATE

John Gregory De Marco, Bridgewater Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 23, 1971, Ser. No. 211,793

Int. Cl. C07c *125/04*

U.S. Cl. 260—482 C 5 Claims

Anhydrous aluminum chloride is used as a catalyst for the reaction of 2-methoxyethanol with urea to give 2-methoxyethyl carbamate.

3,725,465

PREPARATION OF L-3,4-DIHYDROXY-PHENYL-ALANINE

Georg Stoeck; Heinz-Gunter Budka, both of Mannheim-Waldhof; Fritz Topfmeier, Heidelberg, and Wolf-Dietrich Gradel, Mannheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Aug. 3, 1971, Ser. No. 168,737

Claims priority, application Germany, Aug. 7, 1970, P 20 39 253.4

Int. Cl. C07c *101/08*

U.S. Cl. 260—501.11 5 Claims

To an aqueous solution of D,L-N-benzoyl-3,4-dimethoxyphenyl-alanine there is added at least one amine selected from the group consisting of D(-)-threo-1-m-nitrophenyl-2-aminopropanediol-1,3, D(-)-threo-1-p-nitrophenyl-2-aminopropanediol-1,3 and D(-)-threo-1-phenyl-2-aminopropanediol-1,3 selectively to precipitate the amine salt of the L-stereoisomer which is separated, dissolved and acidified to precipitate the free L-stereoisomer which is saponified to L-3,4-dihydroxy-phenyl-alanine. The mother liquor from the initial precipitation containing the amine salt of the D-stereoisomer and some L-stereoisomer is acidified to precipitate the free stereoisomers, leaving the amine in the acidified solution. The precipitated free stereoisomers are racemized and recycled for recovery of additional L-stereoisomer. The acidified solution of amine is rendered alkaline and steps are taken to regenerate and recycle the free amine.

3,725,466

PROCESS FOR THE PREPARATION OF PHOSPHORUS COMPOUNDS HAVING AN ALKYL ETHER SUBSTITUENT AND INTERMEDIATES THEREFOR

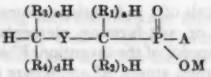
Eugene H. Uhing, Ridgewood, N.J., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation of Ser. No. 626,977, March 30, 1967, abandoned. This application April 6, 1970, Ser. No. 23,095

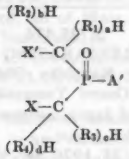
Int. Cl. C07f *9/30*; A01n *9/36*

U.S. Cl. 260—502.4 R 2 Claims

A process for the preparation of compounds of the formula:

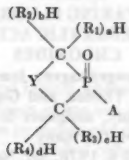


wherein R_1, R_2, R_3, and R_4 are hydrocarbylene groups, *a*, *b*, *c*, and *d* are 1 or O, Y is a chalcogen, A is, hydrocarbyloxy, hydrocarbyl, or OM and M is an alkaline metal. Preparation is effected by reacting an organic phosphorus compound of the formula:



wherein X is halogen and X′ is halogen or hydroxyl wherein A′ is hydroxyl, hydrocarbyloxy, hydrocarbyl, or OM and M is an alkaline metal, with an amount greater than 2 moles of a basic compound MYH. The reaction is conducted at a temperature of from 0° to 150° C. A can also be hydroxyl when the final product is acidified subsequent to its preparation.

Novel intermediate cyclic ether compounds of the formula:



are also prepared by the same process by reacting the corresponding reactant wherein X′ is hydroxyl and basic compound MYH is used in an amount of from about 1 to about 1.2 moles.

Preferred embodiments include X as chlorine, Y as oxygen, and M as sodium.

3,725,467

RECOVERY OF CALCIUM MAHOGANY SULFONATE

Frederick R. Chorney, 5703 Oliva St., Lakewood, Calif.

Filed March 23, 1970, Ser. No. 22,019

Int. Cl. C07b *13/00*

U.S. Cl. 260—504 A **5 Claims**

A by-product of the production of mahogany petroleum sulfonate is a filter cake comprising calcium mahogany sulfonate, lime in various forms, and a filter aid such as diatomaceous earth, generally containing about half its weight of mahogany sulfonate. This by-product is generally discarded. The invention provides a method for the economical recovery of the mahogany sulfonate by a process involving the addition of water and a strong acid having a soluble calcium salt, which permits stratification to take place. The so-formed slurry is subjected to the action of gravity as by standing or passing through a centrifuge or a hydrocyclone, which permits the calcium mahogany sulfonate to be recovered, and if desired, to be subsequently purified.

3,725,468

CARBOXYLATION OF CYCLOPENTADIENE

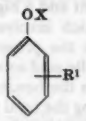
Edwin L. Patmore, Fishkill; William R. Siegart, and Harry Chafetz, both of Poughkeepsie, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 794,344, Jan. 27, 1969, Pat. No. 3,658,874. This application Nov. 10, 1971, Ser. No. 197,529

Int. Cl. C07c *51/00*, *61/28*

U.S. Cl. 260—514 G **5 Claims**

Method of carboxylating an organic compound of the group of RC ≡ CH, RCH_2CN, indene or cyclopentadiene where R is hydrocarbyl comprising contacting under anhydrous conditions in an inert atmosphere and in the presence of an inert, aprotic, dipolar, liquid solvent, said compound with a carbonated metal phenoxide, the metal phenoxide of the formula:



where X is sodium or potassium, R^1 is hydrogen or alkyl, and subsequently acidifying the resultant intermediate product to form the carboxylated product.

3,725,469

PROSTANOIC ACID DERIVATIVES

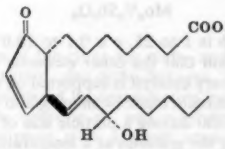
John W. Nelson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 555,236, June 6, 1966, abandoned, which is a continuation-in-part of Ser. No. 480,172, Aug. 16, 1965, abandoned. This application March 23, 1970, Ser. No. 22,037

Int. Cl. C07c *61/36*

U.S. Cl. 260—514 D **3 Claims**

This invention is a group of compounds of the formula:



wherein R_1 is hydrogen or a pharmacologically acceptable cation, essentially free of pyrogens, antigens, proteins, enzymes, cellular material, and other organic acids or salts thereof. These compounds are useful as vasodepressors and antisecretory agents.

3,725,470

AMINO ACID DERIVATIVES

Hermann Bretschneider, Innsbruck, Austria; Ado Kaiser, Neufrenkendorf, Switzerland, and Kraft Hohenlohe-Oehringen, Innsbruck, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 8, 1970, Ser. No. 35,876

Claims priority, application Switzerland, May 14, 1969, 7350/69; May 14, 1969, 7351/69; May 14, 1969, 7352/69

Int. Cl. C07c *65/02*, *101/00*

U.S. Cl. 260—519 **13 Claims**

A process for preparing 3,4-dihydroxy phenylalanine derivatives including novel 3,4-dihydroxy phenylalanine derivatives wherein the phenyl ring contains an additional sub-

stituent which can be hydroxy, lower alkyl, lower alkoxy, halogen, nitro or amino groups from a mono hydroxy phenyl alanine including novel intermediates in this process. The novel 3,4-dihydroxy-phenylalanine derivatives are useful as blood pressure lowering agents and as anti-parkinson agents.

3,725,471

PROCESS FOR PREPARING HYDROXYBENZOIC ACID

Anatoli Onopchenko, Monroeville; Johann G. D. Schulz, Pittsburgh, and Richard Seekircher, Cheswick, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed April 27, 1970, Ser. No. 32,336

Int. Cl. C07c *65/02*

U.S. Cl. 260—521 R **12 Claims**

A process for converting a benzenoid structure carrying a nuclear methyl substituent and a higher alkyl substituent to a hydroxybenzoic acid which involves heating the benzenoid structure with oxygen in the presence of cobaltic ions dissolved in a lower carboxylic acid solvent to selectively convert the methyl substituent on the benzenoid compound to a carboxylic acid group, heating the total reaction product containing the benzenoid compound in a basic system with molecular oxygen to convert the higher alkyl substituent to the corresponding hydroperoxide substituent and thereafter decomposing the benzenoid hydroperoxide compound to hydroxybenzoic acid and ketone.

3,725,472

PROCESS FOR PREPARING α,β-UNSATURATED CARBOXYLIC ACIDS

Akira Kawano, Tsurugaoka; Kozo Sakakibara, Oicho; Iwao Abe, Iruma-gun, and Takayuki Chonan, Saitama, all of Japan, assignors to Daicel Ltd., Osaka, Japan

Filed July 28, 1970, Ser. No. 59,002

Claims priority, application Japan, Aug. 5, 1969, 44/6180

Int. Cl. C07c *51/26, 57/04*

U.S. Cl. 260—530 N **5 Claims**

α,β-unsaturated carboxylic acid is prepared by oxidizing an α,β-unsaturated carbonyl compound in the vapor phase with a molecular oxygen-containing gas in the presence of a ternary catalyst of the formula:

$$Mo_aV_bSb_cO_d$$

wherein *a* is 12, *b* is 1 to 25, *c* is 0.1 to 10.0 and *d* is 38.65 under the condition that the other elements are completely oxidized. The ternary catalyst is supported on a carrier of sintered metallic aluminum made by shaping into granules metallic aluminum powder having a particle size of 6 to 150 mesh and then sintering the granules at a temperature in the range of 600° C. to 660° C.

3,725,473

N-(2-HYDROXYHYDROCARBONYL) IMINODICARBOXYLATES

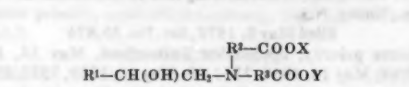
Bjorn Sundby, Piscataway; Edward J. Kenney, Bernardsville, and Harold E. Wixon, New Brunswick, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 28, 1969, Ser. No. 880,992

Int. Cl. C07c *101/20*

U.S. Cl. 260—534 E **5 Claims**

Novel N-(hydroxyhydrocarbyl) iminodicarboxylates or the corresponding carboxylic acids are of the formula:



wherein R^1 is an aliphatic hydrocarbon radical of 4 to 20 carbon atoms, R^2 and R^3 are divalent aliphatic or aromatic hydrocarbon radicals of 1 to 9 carbon atoms and X and Y are either hydrogen or salt-forming elements or radicals. In preferred embodiments of the invention, R^1 is a saturated radical of 12 to 20 carbon atoms, R^2 and R^3 are identical alkylene radicals of 1 to 2 carbon atoms, and X and Y are the same monovalent metals, or lower alkanolamines e.g., sodium, triethanolamine.

The novel compounds are surface active and substantive to fibrous materials such as cotton, wool and synthetics. They are useful as detergents or as components of detergent compositions. Preferred compounds function very effectively as softening agents, either alone or in conjunction with other detergent composition materials. Additionally, they may be used as starting materials for the manufacture of corresponding N-oxides, which also may be employed as detergents and textile softeners.

3,725,474

METHOD FOR SEPARATING CITRIC ACID

Kiyoshi Nara, Kyoto; Kazuhiko Ohta, Osaka; Kazuyoshi Katamoto, Osaka; Osami Yamazaki, Osaka, and Hideo Fukuda, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sept. 25, 1970, Ser. No. 75,328

Claims priority, application Japan, Sept. 25, 1969, 44/76400

Int. Cl. C07c *59/16*

U.S. Cl. 260—535 P **2 Claims**

Citric acid is removed as tricalcium citrate from an aqueous fluid containing water soluble salts of citric acid and (+)-isocitric acid. To the aqueous fluid is added from about 0.4 to about 0.8 equivalent relative to citric acid of an inorganic calcium compound to precipitate the tricalcium citrate which is recovered from the fluid.

3,725,475

PROCESS OF PREPARING FLUORINE CONTAINING PERHALOGENCARBOXYLIC ACID FLUORIDES OR CHLORIDES

Heinrich Paucksch, Langenhagen; Joachim Massonne, Hannover; Horst Bohm, Thonse, and Gunter Fernschild, Hannover, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

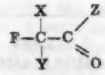
Filed April 6, 1970, Ser. No. 31,048

Claims priority, application Germany, April 5, 1969, P 19 17 630.8

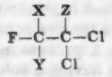
Int. Cl. C07c *51/58*

U.S. Cl. 260—544 F **6 Claims**

Process of preparing fluorine containing perhalogencarboxylic acid fluorides or chlorides having the formula:



in which X if F, Cl or R, Y is F or R, Z is F or Cl and R is $CF_2X(CFX)_n$ wherein *n* is 0 to 7, by reacting a fluorochloroalkane having the formula:



in which X and Y are as above defined with SO_3 in a mol ratio of fluorochloroalkane to SO_3 of 1:1 to 1:1.5, comprising con-

tinuously conducting such fluoroalkane through a mixture of liquid SO_3 and SO_2Cl_2 and/or $S_2O_5Cl_2$ present in a volume ratio of 1:0.05 to 1:20 and to which there is preferably added catalytic amounts of $HgSO_4$ and/or concentrated H_2SO_4 at a temperature of between 0° and 200° C and during the reaction maintaining a part by volume of 5 to 95 percent SO_2Cl_2 and/or $S_2O_5Cl_2$ in the reaction mixture.

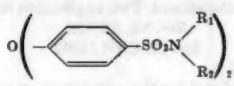
3,725,476

UNSATURATED AMIDES OF OXYBIS (BENZENESULFONIC ACID)

John C. Blackwood, Melrose; Edwin O. Hook, Marshfield, and Walter Beck, Bedford, all of Mass., assignors to Stepsan Chemical Company, Northfield, Ill.

Filed Sept. 15, 1971, Ser. No. 180,850
Int. Cl. C07c *143/78*
U.S. Cl. 260—556 AR **7 Claims**

Unsaturated amides of oxybis(benzenesulfonic acid), particularly the mono, di, tri and tetraallyl or methallyl amides, are useful as cross-linking agents for polymeric materials, or as monomers or comonomers in producing allylic-type resins. Such unsaturated amides may be represented by the formula:



wherein

R_1 is a C_3—C_{12} alkenyl radical wherein the terminal carbon atom has two hydrogen atoms and is bonded to the penultimate carbon atom by means of a double bond; and

R_2 is a R_1 radical, a C_1—C_8 alkyl radical, a phenyl radical or hydrogen.

3,725,477

OXIMINO KETONES AND METHOD FOR MANUFACTURING AMINO ACIDS FROM SAID KETONES

Jerome Robert Olechowski, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

Filed Aug. 27, 1971, Ser. No. 175,727
Int. Cl. C07c *119/00*
U.S. Cl. 260—566 A **1 Claim**

Cycloalkane oximino ketones containing up to about 12 ring carbon atoms are prepared by reacting a cyclic hydrocarbon containing up to about 12 ring carbon atoms with hydroxyl amine and oxygen in the presence of a cuprous salt and ultra-violet radiation. The oximino ketones are oxidized to the hydroxamido alkanoic acid which is reduced catalytically to an amino acid. Cyclododecane is reacted in one embodiment with hydroxyl amine and oxygen in the presence of a cuprous salt and ultra-violet light to obtain 1-oximinocyclododecane-2-one which, in turn is oxidized to 12-hydroxamidododecanoic acid, this acid being reduced to 12-aminododecanoic acid. The amino acid is heated to obtain a polyamide which is used for the manufacture of fibers and molded articles, such as containers and the like.

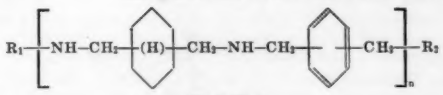
3,725,478

POLYAMINES OF XYLENED AMINES

Ernst Hanschke, Burghausen; Walter Fester, Konigstein/Taunus, and Franz Jakob, Hofheim/Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning, Frankfurt/Main, Germany

Filed Aug. 19, 1970, Ser. No. 65,293
Claims priority, application Germany, Aug. 26, 1969, P 19 43 253.2
Int. Cl. C07c *87/28*
U.S. Cl. 260—570.5 P **1 Claim**

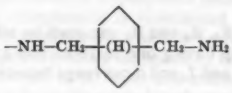
Polyamines of the formula



in which n represents a whole number of from 1 to 10, preferably from 1 to 3,

R_1 represents H or

R_2 represents NH_2 or



and the linkages of the rings are meta- and/or para-linkages and, to a small extent, also ortho-linkages. These polyamines are preferably prepared by desaminating hydrogenation of at least one of the isomeric m- and p-xylylene diamines, optionally in admixture with a small amount of o-xylylene diamine; they are suitable, for example, as modification components for the preparation of film and fiber-forming polyamides.

The rings in the said polyamines may also contain low molecular weight alkyl-substituted groups; this means, of course, that the starting substances for the preparation of the polyamines carry corresponding alkyl-substituents.

3,725,479

BIS(4-AMINO-OR 4-SUBSTITUTED AMINO-3,5-DINITROPHENYL) DISULFIDE

William N. Cannon, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed April 20, 1970, Ser. No. 30,228
Int. Cl. C07c *87/62*
U.S. Cl. 260—576 **6 Claims**

Bis(hydroxy, amino, or substituted lower alkyl, alkenyl, or alkynylamino-3,5-dinitrophenyl)disulfide prepared by treating 4-chloro-3,5-dinitrophenyl thiocyanate with an alkali metal hydroxide, carbonate, acid carbonate, or nitrite, ammonium hydroxide, ammonia, or a primary or secondary lower aliphatic amine; useful as intermediates for the synthesis of herbicides.

3,725,480

ASHLESS OIL ADDITIVES

Thornton P. Traise, Chicago Heights; Roger W. Watson, Batavia, both of Ill., and Randel Q. Little, Munster, Ind., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 774,497, Nov. 8, 1968, Pat. No. 3,591,598. This application Oct. 15, 1970, Ser. No. 81,190
Int. Cl. C08g 9/04, 9/26, 9/34, 37/24, 37/18, 37/36
U.S. Cl. 260—583 P 3 Claims

This invention concerns the condensation product of an aldehyde reactant having more than one carbon atom and/or ketone reactant, formaldehyde, an alkylene polyamine, and an alkyl-substituted phenol. These compositions can be used as ashless alkaline additives for lubricating oils.

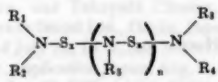
3,725,481

OLIGOMER COMPOSITION FROM ALKYL AMINE AND SULFUR CHLORIDES

Kyung S. Shim, Dobbs Ferry, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation of Ser. No. 800,711, Feb. 19, 1969, abandoned. This application March 3, 1971, Ser. No. 120,731
Int. Cl. C08f 27/06; C07c 85/00
U.S. Cl. 260—583 EE 3 Claims

An oligomer vulcanizing agent and products made therefrom are described herein. The oligomer composition has the following formula:



wherein R_1, R_2, R_3, R_4 and R_5 can each be selected from the lower alkyl group having one to 10 carbon atoms and x can range between 1 and 7, and n can range between 0.5 and 15.

3,725,482

PROPYLENE OXIDATION IN THE PRESENCE OF GOLD METAL

Noel W. Cant, and William K. Hall, both of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 16, 1969, Ser. No. 858,531
Int. Cl. C07c 45/04
U.S. Cl. 260—604 R 8 Claims

Propylene is oxidized with oxygen to primarily acrolein by oxidation in the contact presence of gold metal.

3,725,483

A PROCESS FOR THE HYDROFORMYLATION OF OLEFINS

John F. Deffner, Glenshaw; Edmond R. Tucci, Pittsburgh; Helen I. Thayer, and John V. Ward, both of Oakmont, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Aug. 23, 1966, Ser. No. 574,305
Int. Cl. C07c 45/08
U.S. Cl. 260—604 HF 8 Claims

An Oxo process wherein an olefin is reacted with hydrogen and carbon monoxide in the presence of a cobalt carbonyl and a trioxadiphosphabicyclooctane, preferably in the presence of a trialkyl amine.

3,725,484

METHOD FOR OXIDIZING ALKYLATED AROMATIC COMPOUNDS

Ken Ito; Hiroshi Kaminaka, both of Toyonaka-shi; Norio Kotera, Amagasaki-shi; Shinji Yamamoto, Nishinomiya-shi; Iwao Dogane, Nishinomiya-shi; Kosuke Shigehiro, Nishinomiya-shi; Hiroshi Kuruma, Takarazuka-shi; Takashi Chinuki, Yoyonaka-shi; Hiroshi Yoshitake; Kenji Tanimoto, both of Minoo-shi; Shinichi Hasegawa, Amagasaki-shi, and Nobuki Kobayashi, Fukushima-ku, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Feb. 21, 1968, Ser. No. 707,304
Claims priority, application Japan, Feb. 25, 1967, 42/12159
Int. Cl. C07c 73/08
U.S. Cl. 260—610 B 7 Claims

Hydroperoxides of alkylaromatic compounds are prepared by contacting the alkylaromatic compounds having at least one alkyl or cycloalkyl substituent group having a tertiary carbon atom in the α-position with respect to the aromatic nucleus, with oxygen or a molecular oxygen-containing gas in the presence of 0.001 to 10 percent by weight of molybdenum disulfide at room temperature to 200°C. for 1 to 100 hours.

3,725,485

SEPARATION OF META AND PARA-CRESOL

Joseph C. Martini, Houston, Tex., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 809,947, March 24, 1969, Pat. No. 3,598,842, which is a continuation-in-part of Ser. No. 731,271, May 22, 1968, abandoned. This application Nov. 12, 1970, Ser. No. 89,123
Int. Cl. C07l 39/02
U.S. Cl. 260—621 A 6 Claims

A process is defined for the separation of para-cresol from admixture with meta-cresol by the selective condensation of meta-cresol with isobutyraldehyde using a catalyst comprising an aqueous solution of a hydrogen halide.

3,725,486

PROCESS FOR MAKING 1,1-DICHLORETHYLENE FROM 1,1,2-TRICHLORETHANE

William L. McCracken, Southfield; Wilbur H. Petering; Charles E. Kircher, Jr., both of Detroit, and Paul R. Pinchak, Saint Clair Shores, all of Mich., assignors to Detrex Chemical Industries, Inc., Detroit, Mich.

Filed May 23, 1969, Ser. No. 827,139
Int. Cl. C07c 21/20
U.S. Cl. 260—654 D 9 Claims

A dehydrochlorination process for the formation of 1,1-dichlorethylene from 1,1,2-trichlorethane in which an aqueous emulsion of 1,1,2-trichlorethane and an alkaline earth metal hydroxide is made to which there is added an aqueous solution of an alkali metal hydroxide in stoichiometric amount, thereby forming 1,1-dichlorethylene, which is continuously removed.

3,725,487

PREPARATION OF DIHALOALKANES AND RELATED PRODUCTS

Alexander F. MacLean; Charles C. Hobbs, Jr., and Edward F. Dougherty, all of Corpus Christi, Tex., assignors to Celanese Corporation of America, New York, N.Y.

Continuation of Ser. No. 473,807, July 21, 1965, abandoned. This application April 13, 1970, Ser. No. 31,880
Int. Cl. C07c 17/00
U.S. Cl. 260—659 R 5 Claims

Process for the preparation of an alpha-, omega-disubstituted alkane by reacting a vinyl compound such as ethylene with a chlorine, bromine, or cyanide ion in the presence of an inorganic symmetrical per oxygen compound and a metallic ion of Ni^{+2}, Co^{+2}, Mn^{+2}, Tb^{+3}, Nd^{+3}, Pr^{+3}, Fe^{+2}, Cu^{+2}, or Tl^{+1}.

3,725,488

MULTILITHIUM POLYMERIZATION INITIATORS

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 21, 1971, Ser. No. 108,612
Int. Cl. C07f 1/02
U.S. Cl. 260—665 R 10 Claims

Multilithium polymerization initiators are prepared by the metalation of multimethyl-substituted aromatic hydrocarbons with tertiary or secondary alkyl or cycloalkyllithium compounds in hydrocarbon media.

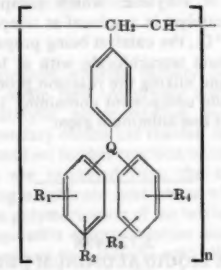
3,725,489

HYDROGENATION OF ALKENES EMPLOYING AN ORGANOMETALLIC HYDROGENATION CATALYST

Robert Fuhrmann, Morris Plains, and Jan F. Van Peppen, Chester, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,359
Int. Cl. C07c 5/02, 5/16, 9/00
U.S. Cl. 260—666 P 3 Claims

Complexes of rhodium, ruthenium, platinum, palladium, osmium, or iridium with polymers of the structure:



wherein Q is phosphorous, arsenic or antimony, and wherein R_1, R_2, R_3, and R_4 are independently hydrogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy or C_1 to C_8 dialkyl amino, and wherein n is 10 to 500, are potent catalysts for the hydrogenation of ethylenic or acetylenic double bonds.

3,725,490

PROCESS FOR SEPARATING DIMETHYL NAPHTHALENES COMPRISING 2,6-DIMETHYL NAPHTHALENE AS MAIN COMPONENT

Shizuo Nagahama; Keizo Shimada, and Seizi Kurozumi, all of Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan

Filed March 30, 1971, Ser. No. 129,621
Claims priority, application Japan, Dec. 22, 1970, 45/116410; March 30, 1970, 45/26748; March 31, 1970, 45/27301; March 31, 1970, 45/27302; April 1, 1970, 45/27697; Oct. 3, 1970, 45/96047; Nov. 12, 1970, 45/99074
Int. Cl. C07c 7/02
U.S. Cl. 260—674 N 10 Claims

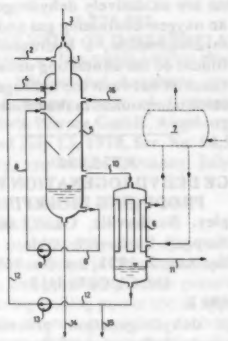
A process for separating dimethyl naphthalenes the main component of which is 2,6-dimethyl naphthalene in the form of their complexes with m-nitrobenzoic acid, which comprises contacting a dimethyl naphthalene isomer mixture comprising at least 2,6-dimethyl naphthalene or a hydrocarbon mixture containing such dimethyl naphthalene isomer mixture with m-nitrobenzoic acid, to thereby form a mixture of complexes of the dimethyl naphthalenes with m-nitrobenzoic acid the main component of which is a complex of 2,6-dimethyl naphthalene with m-nitrobenzoic acid, and separating the complexes in the solid state from the reaction mixture.

3,725,491

PROCESS FOR RECOVERING HEAT FROM GAS MIXTURES OBTAINED BY THE THERMAL CRACKING OF HYDROCARBONS

Hartman Voigt; Erich Schneck; Klaus Gunther, and Klaus Noha, all of Frankfurt/Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Feb. 16, 1971, Ser. No. 115,319
Claims priority, application Germany, Feb. 18, 1970, P 20 07 269.9
Int. Cl. C07c 11/24
U.S. Cl. 260—679 R 2 Claims



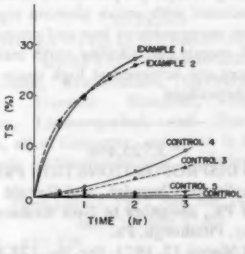
In a process for the production of acetylene and/or lower olefins from hydrocarbons the enthalpy of cracked gas is recovered in two stages by an oil wash. In the first stage of the oil wash using temperatures within the boiling range of the wash oil and approximately atmospheric pressures, a cycle of high-boiling oil components is maintained and condensed lower boiling oil components which are recycled from the second wash stage are directly vaporized by the cracked gases. The saturated mixture of oil vapor and cracked gases formed in the first stage is fed to the second wash stage and condensed therein by indirect cooling.

3,725,492

PROCESS FOR THE PREPARATION OF LIQUID POLYBUTADIENE

Keizo Ukita, and Toshimasa Sadamori, both of Tokuyama, Japan, assignors to The Japanese Geon Company, Ltd., Tokyo, Japan

Filed Oct. 26, 1970, Ser. No. 83,832
Int. Cl. C08f 3/18
U.S. Cl. 260—680 B 8 Claims



A process for the preparation of liquid polybutadiene of an average molecular weight of 1,000 – 20,000 containing at least 70 percent of cis-1,4 configuration, which comprises initiating the polymerization of butadiene in a 15 – 70 weight

percent butadiene solution in butene-1, in the presence a catalyst system obtained by mixing together an organoaluminum compound of the formula R_nAlCl_{3-n}, wherein R is an aliphatic hydrocarbon residue of 1 – 6 carbon atoms and *n* is a number from 1 to 2, an organonickel compound and water.

3,725,493

OXIDATIVE DEHYDROGENATION

Roy L. Stine, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 677,719, Oct. 24, 1967, abandoned. This application Aug. 24, 1970, Ser. No. 66,559

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **7 Claims**

Hydrocarbons are oxidatively dehydrogenated by contacting them with an oxygen-containing gas and a catalyst and following the dehydrogenation, a hydrogen-containing gas is added to the effluent of the contacting under conditions suitable to cause a reaction between the hydrogen and residual oxygen or oxygenated compounds in the effluent.

3,725,494

TWO-STAGE DEHYDROGENATION PROCESS FOR PRODUCING DIOLEFINS

Dennis L. Ripley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 2, 1971, Ser. No. 168,464

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **6 Claims**

A two-stage dehydrogenation process for producing diolefins from monoolefins wherein the monoolefin stream is first dehydrogenated under non-oxidative conditions, followed by an oxidative dehydrogenation with an iron phosphate catalyst. Isoprene is produced from a feedstream containing isoamylenes by a two-stage dehydrogenation process wherein the necessity of removing hydrogen from the non-oxidative effluent is eliminated through a selective second stage oxidative dehydrogenation stage.

3,725,495

CATALYTIC STEAM CRACKING OF HYDROCARBONS AND CATALYSTS THEREFOR

Johannes Wrisberg, Gammel Holte; Kjeld Jorn Andersen, Tulstrup, and Erik Mogensen, Ramlose, all of Denmark, assignors to Haldor Frederik Axel Toksoe, Frydenlundsvej Vedbaek, Denmark and Fluor Corporation, Los Angeles, Calif.

Filed Dec. 17, 1970, Ser. No. 99,271

Claims priority, application Great Britain, Dec. 23, 1969, 62,552/69

Int. Cl. C07c *3/34*; C10g *11/04*

U.S. Cl. 260—683 R **19 Claims**

Steam cracking of saturated hydrocarbons to form unsaturated hydrocarbons, such as ethylene, propylene, butylenes, butadiene, and aromatics, is carried out in the presence of a catalyst comprising a major proportion of oxides of zirconium or hafnium associated with active alumina together with oxides of chromium, manganese or iron and promoted with compounds of alkali metals and alkaline earth metals. High conversion efficiences are achieved at high space velocities and without carbon deposition.

3,725,496

OLEFIN DISPROPORTIONATION PROCESS

Tadeusz P. Kobylinski, Cheswick, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed March 17, 1971, Ser. No. 125,439

Int. Cl. C07c *3/62*

U.S. Cl. 260—683 D **10 Claims**

A process for converting, by disproportionation, an olefin, particularly an alpha-olefin, to a product containing a mixture of olefins of higher and lower carbon number than at least one of the olefins in the olefin charge, which involves contacting the olefin charge under disproportionation reaction conditions including a temperature from 15°C. to 120°C. with a catalyst composition containing molybdenum, cobalt-molybdenum, tungsten or rhenium on an alumina containing support. The catalyst is initially pretreated with an olefin having two to 10 carbon atoms at a temperature higher than the reaction temperature.

3,725,497

PROCESS FOR THE OLIGOMERIZATION OF ETHYLENE

Takaaki Arakawa, 2-4, 1-chome, Muronki-cho; Kenji Saeki, 12-57, 5-chome, Shozoku-cho, both of Iwakuni-shi, Yamaguchi; Yoshikuni Sato, 12-35, 2-chome, Shinmachi, Otake-shi, Hiroshima, and Yoriya Kitazawa, 213-3, Oaza Waki, Waki-mura, Kuga-gun, Yamaguchi, all of Japan

Division of Ser. No. 862,029, Sept. 29, 1969, Pat. No. 3,652,705. This application Sept. 20, 1971, Ser. No. 182,231

Claims priority, application Japan, Oct. 3, 1968, 43/71612; Oct. 3, 1968, 43/71613; Oct. 3, 1968, 43/71614; Oct. 3, 1968, 43/71616; Feb. 25, 1969, 44/13605; Feb. 25, 1969, 4/13606; March 25, 1969, 44/22043

Int. Cl. C07c *3/10*

U.S. Cl. 260—683.15 D **6 Claims**

A process for the preparation of higher olefins by oligomerization of ethylene, which comprises contacting ethylene with a catalyst in a solvent at temperatures ranging from –30° – +80° C., the catalyst being prepared by the steps of reacting titanium tetrachloride with at least one ketone electron donor, and mixing the reaction product with an aluminum alkyl halide component containing 1.8 – 2.8 bonded halogen atoms per one aluminum atom.

3,725,498

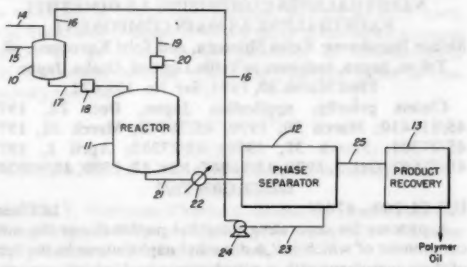
RECYCLABLE LIQUID ALUMINUM CHLORIDE AND BROMIDE COMPLEXES

James A. Brennan, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 745,415, July 17, 1968, abandoned, which is a continuation-in-part of Ser. No. 598,564, Oct. 17, 1966, abandoned, which is a continuation-in-part of Ser. No. 334,394, Dec. 30, 1963, abandoned. This application May 27, 1970, Ser. No. 41,709

Int. Cl. C07c *3/18*

U.S. Cl. 260—683.15 B **3 Claims**



Solutions of aluminum chloride or aluminum bromide, in molar excess, in methyl, ethyl, and propyl esters of C_3–C_{10} normal alkanoic acids, having a total of at least five carbon atoms, remain stable for at least 3 days. These solutions are useful catalysts for reactions, such as olefin polymerization and can be recovered and recycled.

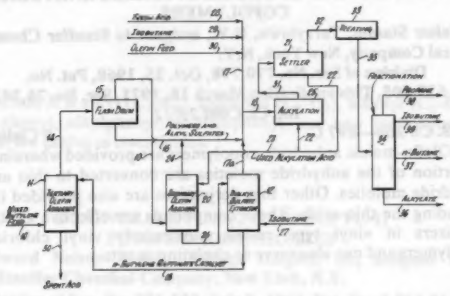
3,725,499
ALKYLATION OF SECONDARY OLEFINS DERIVED FROM HYDROCARBON COMPOSITIONS CONTAINING TERTIARY OLEFINS

Arthur R. Goldsby, Chappaqua, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 740,761, June 27, 1968, Pat. No. 3,591,523. This application June 25, 1970, Ser. No. 49,693. The portion of the term of this patent subsequent to March 24, 1987, has been disclaimed.

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.62 8 Claims



Alkylation process wherein tertiary olefins are removed from a mixed olefin feed comprising tertiary and secondary olefins by catalytic polymerization and distillation, the remaining secondary olefins are reacted in excess with strong sulfuric acid until no further reaction occurs, the resulting dialkyl sulfates are extracted from the olefin-acid reaction product leaving a raffinate acid phase which is used as the catalyst for the polymerization of the tertiary olefins. The dialkyl sulfate-isoparaffin extract solution and the tertiary olefin polymers are passed to a sulfuric acid alkylating zone where they are alkylated with isoparaffin.

3,725,500
CATALYST MIXTURE OF ALUMINUM HALO BROMIDE AND SULFUR OXO HALIDE AND ITS USE IN ISOMERIZATION

George M. Kramer, Berkeley Heights, N.J., assignor to Esso Research and Engineering Company

Continuation of Ser. No. 862,046, Sept. 29, 1969, abandoned. This application Sept. 28, 1971, Ser. No. 184,613

Int. Cl. C07c *5/28*; B01j *11/74*

U.S. Cl. 260—683.68 5 Claims

A catalyst composition comprising (1) aluminum halo bromides such as aluminum bromide and (2) sulfur oxo halides such as sulfurylfluorochloride stabilizes high alkyl carbonium ion concentrations. The catalyst is useful in isomerization processes for converting normal paraffins and naphthenes to isoparaffins and highly branched naphthenes.

3,725,501
INTERCROSSING RESIN/CURING AGENT ADHESIVE SYSTEMS

Ronald D. Hilbelink, Dayton, and Gavin H. Peters, Lebanon, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 60,962, July 2, 1970, Pat. No. 3,657,379, which is a division of Ser. No. 840,060, July 8, 1969, abandoned. This application Jan. 28, 1972, Ser. No. 221,836

Int. Cl. C08g *47/10*, *45/06*, *39/10*

U.S. Cl. 260—824 R 2 Claims

Novel adhesive systems are disclosed which pertain to combinations of more than one curable resin and the curing agents corresponding thereto. The disclosed adhesive systems comprise separated reactive components wherein: (a) a first reactive polymeric material is combined with a curing agent for a second reactive polymeric material to yield one component and; (b) the second reactive polymeric material is combined with a curing agent for the first reactive polymeric material to form another component. Several embodiments relating to intercrossing combinations of the two components are disclosed. In all of the embodiments, when the reactive materials from two components are combined, the curing agents react with their respective, intercrossed, reactive polymeric material to yield strong adhesive bonds. Of particular interest in this invention are embodiments of the adhesive systems which pertain to a rapidly curing adhesive and especially to such an adhesive for use underwater.

3,725,502
WATER-SOLUBLE OR INHERENTLY WATER-DISPERSIBLE CONDENSATION PRODUCTS

Willy Bernheim, Diedorf bei Augsburg, and Hans Deiner, Neusass bei Augsburg, both of Germany, assignors to Chemische Fabrik Pfersee GmbH, Augsburg, Germany

Filed July 13, 1970, Ser. No. 54,590

Claims priority, application Germany, July 19, 1969, P 19 36 886.6

Int. Cl. C08g *30/14*

U.S. Cl. 260—830 TW 6 Claims

Water-soluble or inherently water-dispersible condensation products which cross link with heating are prepared by reacting with heating, and preferably in the presence of water-miscible solvents having boiling points above approximately 50°;

a. about 1 mole of urea, guanidine, derivatives of guanidine or the products of the decomposition of guanidine derivatives; with

b. about 0.25 – 2.5 moles of an epoxy compound containing in the molecule on the average more than one epoxy group; and

c. about 0.1 – 2.0 moles of an amine of the general formula

wherein R_1 represents an alkyl group having 2–4 carbon atoms or an alkanol group having 2–5 carbon atoms, R_2 and R_3 represent hydrogen, an alkyl group having 1–4 carbon atoms or an alkanol group having 2–5 carbon atoms, wherein R_2 and R_3 represent identical or different groups and at least two reactive hydrogen atoms present in the molecule;

and terminating the reaction by the addition of a volatile acid and water. The condensation products are particularly useful as curing agents for dialkyl and alkyl hydrogen polysiloxanes and mixtures thereof, wherein about 10-45 percent of the condensation products, based on the organo polysiloxanes, are employed as the curing agents.

3,725,503
POLYAMIDES WITH DISPERSED OXYALKYATED GRAFTED POLYAMIDES

Joachim Kunde, Frankenthal; Gerhard Ramlow, Ludwigshafen; Guenter Buechler, Heidelberg; Heinz Pohlemann, Limburgerhof, and Hans Hendus, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed June 3, 1971, Ser. No. 149,778

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 TW 8 Claims

Filaments or fibers of synthetic linear polyamides containing highly oxyalkylated polyamides. The filaments or fibers are notable for their excellent antistatic properties and their soil-hiding effect.

3,725,504

FAST CURING POLYCHLOROPRENE ACRYLIC ADHESIVE

William J. Owston, Edinboro, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Dec. 30, 1970, Ser. No. 102,884
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—876 R 12 Claims

An adhesive composition capable of curing in a matter of minutes in the presence of free radical vinyl polymerization catalysis consisting essentially of: A, from about 10 to about 52 percent, by weight, of a syrupy copolymer of polychloroprene, methylmethacrylate and styrene; B, from about 7 to below about 15 percent of methacrylic acid, and C, from about 40 to about 83 percent of a solution of an acrylate polymer in methylmethacrylate.

3,725,505

PYRENE CONTAINING POLYMERS PREPARED BY ANIONIC POLYMERIZATION

James J. O'Malley, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 28, 1970, Ser. No. 59,016
Int. Cl. C08f *7/02, 19/00*
U.S. Cl. 260—879 15 Claims

An anionic polymerization process for forming homopolymers of vinylpyrene and block copolymers containing at least one polyvinylpyrene segment is disclosed. Block copolymers having novel structures are also described.

3,725,506

MANUFACTURE OF COPOLYMERS OF STYRENE AND α-METHYLSTYRENE

Herbert Bolte, Frankenthal; Paul Wittmer, Landau; Eduard Heil, Limburgerhof, and Herbert Willersinn, Ludwigshafen, all of Germany, assignors to Badische Anilin-&Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhineland Pfalz, Germany

Filed Nov. 16, 1971, Ser. No. 199,350
Claims priority, application Germany, Nov. 16, 1970, P 20 56 197.1
Int. Cl. C08f *19/02, 19/04*
U.S. Cl. 260—88.2 C 3 Claims

Continuous process for the manufacture of copolymers of styrene and α-methylstyrene having a substantially statistical distribution of the monomers by anionic polymerization at low temperatures with thorough mixing of the reactants.

The process is characterized in that at least part of the heat of reaction is removed by evaporative cooling and that the monomers are fed to the polymerization zone at different points.

3,725,507

PROCESS FOR THE PREPARATION OF VINYL CHLORIDE GRAFT POLYMERS

Satoshi Nakano; Keiichi Azuma; Seiichiro Oba; Samon Wakizaka, and Sunichi Nakamura, all of Tokuyama, Japan, assignors to Tokuyama Soda Kabushiki Kaisha and Sun Arrow Chemical Co., Ltd., Yomaguchi-ken, Japan, part interest to each

Continuation-in-part of Ser. No. 878,948, Nov. 21, 1969, abandoned. This application Oct. 27, 1971, Ser. No. 192,895
Claims priority, application Japan, Nov. 26, 1968, 43/86083
Int. Cl. C08f *37/18, 29/24*
U.S. Cl. 260—896 4 Claims

A process for the preparation of a vinyl chloride polymer composition, which comprises (a) dissolving an oil-soluble polyalkylene oxide such as polypropylene oxide, or a copolymer of propylene oxide in the 1-butene oxide or epichlorohydrin, in a monomeric mixture consisting of 99.5 – 90 parts of a vinyl chloride monomer and 0.5 – 10 parts of a comonomer such as ethylene, propylene or 1-butene, the amount of said oil-soluble polyalkylene oxide being 0.5 – 5 percent by weight based on the monomeric mixture, (b) emulsifying or suspending the resulting solution in water, (c) polymerizing the emulsified or suspended solution and (d) recovering the resulting polymer composition. The vinyl chloride polymer composition obtained has very high impact strength even at low temperatures, and same good transparency and other physical properties as polyvinyl chloride.

3,725,508

THIOL DERIVATIVES OF OLEFIN-MALEIC ANHYDRIDE COPOLYMERS

Walter Stamm, Tarrytown, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 770,798, Oct. 25, 1968, Pat. No. 3,629,205. This application March 18, 1971, Ser. No. 76,342
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 C 9 Claims

Olefin-maleic anhydride copolymers are provided wherein a portion of the anhydride moieties are converted to thio anhydride moieties. Other thio derivatives are also provided including the thio acids. These compounds are effective as stabilizers in vinyl type resins, particularly vinyl chloride polymers and can also serve as chelating agents.

3,725,509

FIRE RETARDANT THERMOPLASTIC POLYMER COMPOSITIONS OF A METHYL METHACRYLATE POLYMER WITH A COPOLYMER OF A HALOGENATED ETHYLENICALLY UNSATURATED MONOMER AND A PHOSPHOROUS CONTAINING VINYL MONOMER

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Filed June 23, 1970, Ser. No. 49,204
Int. Cl. C08f *29/24*
U.S. Cl. 260—899 10 Claims

Self-extinguishing, thermoplastic polymer compositions are prepared by the intimate admixture of a thermoplastic polymer with a copolymer of a halogen containing ethylenically unsaturated monomer and a phosphorus containing vinyl monomer, particularly a bis(hydrocarbyl)vinylphosphonate. The thus modified thermoplastic polymers display a high degree of flame retardance without any substantial changes in their physical properties including, for example, their clarity and hardness and the resulting compositions may be safely employed in any application requiring their possible exposure to fire or high temperatures.

3,725,510

PHOSPHITE-PHOSPHATES

James L. Dever, Lewiston, and James J. Hodan, Williamsville, both of N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 5, 1970, Ser. No. 9,048
Int. Cl. C07f *9/12*; C07d *105/04*; C08f *45/58*
U.S. Cl. 260—927 R 9 Claims

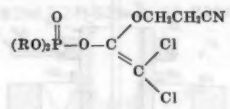
Trivalent phosphorus halides and tertiary phosphites react readily with a para-quinone to produce arylene phosphite-phosphate derivatives useful as flame retardants for organic materials.

3,725,511
1-(2-CYANOETHOXY)-2,2-DICHLOROVINYL PHOSPHATE ESTERS

Stanley T. D. Gough, Branchburg, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed April 13, 1970, Ser. No. 27,993
Int. Cl. A01n 9/36; C07f 9/08
U.S. Cl. 260—940 3 Claims

Compound having the formula:



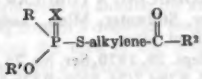
wherein R is alkyl (C_1–C_4), haloalkyl (C_1–C_4), alkenyl (C_2–C_4), phenyl, alkylphenyl, or halophenyl, are new compounds that are useful as insecticides.

3,725,512
O-LOWERALKYL-S-(2-OXOPROPYL-1) PHOSPHONODITHIOATES

Edward Nelson Walsh, Chicago Heights, Ill., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 381,509, July 9, 1964, Pat. No. 3,564,013.
This application Sept. 28, 1970, Ser. No. 76,301
Int. Cl. C07f 9/16
U.S. Cl. 260—946 4 Claims

Phosphonated mercaptals and mercaptoles corresponding to the formula



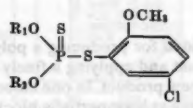
wherein "alkylene" means a divalent saturated aliphatic radical having from one to three carbon atoms; R is selected from the group consisting of lower alkyl and phenyl and R′ is lower alkyl; X is selected from the group consisting of sulfur and oxygen; R^2 is lower alkyl of from one to three carbon atoms.

3,725,513
PHOSPHORIC ACID ESTERS

Ernst Beriger, Neuallschwil, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed April 27, 1970, Ser. No. 32,414
Claims priority, application Switzerland, April 28, 1969, 6444/69
Int. Cl. C07f 9/08
U.S. Cl. 260—951 3 Claims

Dithiophosphates of the formula



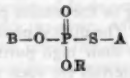
wherein R_1 and R_2 represent alkyl radicals of up to four carbon atoms are effective pesticidal agents, preferably for combating insects, nematodes and members of the order Acarina. The dithiophosphates may be used in pesticidal preparations.

3,725,514
O-ARYL O-ALKYL S-ORGANO PHOSPHOROTHIDATES

Hiroshi Tsuchiya, Ashiya-shi; Kunio Mukai, Nishinomiya-shi; Akio Kimura, Ikedo-shi; Suminori Kawano, Minoo-shi; Keimei Fujimoto, Kobe; Toshiaki Ozaki, Yamamoto, Sigeo; Yositosi Okuno, Toyanaki-shi; Katsutoshi Tanaka, Takarazuka-shi; Tadashi Ooishi, and Hisami Takeda, both of Minoo-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan

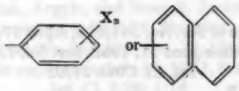
Filed Nov. 3, 1969, Ser. No. 873,503
Claims priority, application Japan, Nov. 12, 1968, 43/82963; Nov. 14, 1968, 43/83366
Int. Cl. C07f 9/18; A01n 9/36
U.S. Cl. 260—964 5 Claims

Novel organic phosphorothiolates, which have both strongly insecticidal and fungicidal activities and low toxicity to mammals, having the formula,



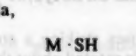
(I)

wherein R is lower alkyl; A is alkyl, alkenyl, alkinyl, haloalkyl or phenylalkyl; B is a group of the formula,



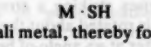
X being phenyl, phenylalkyl, alkoxy, dialkylamino, acylamido or halogen, provided that at least one X is group other than halogen atom, and *n* being an integer of 1 – 5.

These organic phosphorothiolates can be obtained by reacting a thionophosphate having the formula,



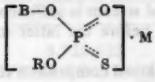
(II)

wherein R and B are as defined above, with an alkali hydrosulfide having the formula,



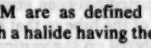
(III)

wherein M is an alkali metal, thereby forming a thiophosphate having the formula,



(IV)

wherein B, R and M are as defined above, and then condensing said salt with a halide having the formula,



(V)

wherein Y is halogen; and A is as defined above.

3,725,515
PROCESS FOR THE PREPARATION OF DIALKYL PHOSPHITES FROM ALCOHOLS AND PHOSPHOROUS ACID

Kurt Schimmelschmidt, Bad Homburg, and Hans-Jerg Kleiner, Bad Soden, Taunus, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft Vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed March 4, 1970, Ser. No. 16,609
Int. Cl. C07f 9/08
U.S. Cl. 260—978 **7 Claims**

Improved process for the preparation of dialkyl phosphites by means of refluxing phosphorous acid with alcohols under azeotropic separation of the reaction water formed, wherein primary or secondary straight-chained or branched aliphatic alcohols having at least 4 carbon atoms are reacted in an excess of at least 45 percent over the stoichiometrical amount with phosphorous acid in the absence of an inert solvent until the amount of acid in the reaction mixture is as low as possible. In comparison to known processes the dialkyl phosphites are obtained according to the instant process in higher yields and with higher purity. The dialkyl phosphites are valuable intermediates. Owing to their high purity, they are especially suitable as starting materials for such reactions catalyzed by radicals.

3,725,516
MIXING PROCESS AND EXTRUSION OF SOLID PROPELLANTS

Martin H. Kaufman, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Continuation of Ser. No. 361,612, April 17, 1964. This application June 11, 1968, Ser. No. 738,721
Int. Cl. C06b 21/02
U.S. Cl. 264—3 B **4 Claims**

An improved extrudable, high energy solid propellant composition consisting essentially of the copolymer of vinylidene fluoride and perfluoropropylene (Viton), an inorganic oxidizer such as ammonium perchlorate, potassium perchlorate or ammonium nitrate, and a metal powder such as aluminum, beryllium, magnesium or zirconium. This composition is extrudable into any suitable shape and has a very high percentage theoretical maximum density so as to be practical for utilization in rocket motors for propulsion.

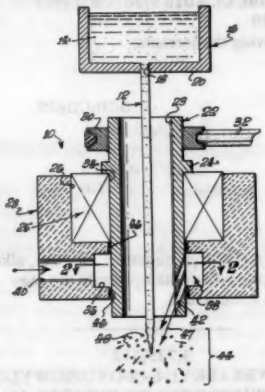
3,725,517
POWDER PRODUCTION BY GAS ATOMIZATION OF LIQUID METAL

Albert R. Kaufmann, Lexington, Mass., assignor to Whittaker Corporation

Filed Nov. 26, 1971, Ser. No. 202,351
Int. Cl. B01j 2/04
U.S. Cl. 264—12 **7 Claims**

This method comprises striking a stream of liquid metal with a jet of gas which is rotated about the liquid metal stream so that it strikes the latter at an angle of between about 5° and about 90° with respect to the flow axis of the liquid stream to break up the liquid metal into small drops which solidify as a powder. The width of the gas jet is preferably less than that of the liquid metal stream. The rotational velocity of the gas jet about the liquid metal stream is sufficient to circle the liquid stream at least once before the latter moves out of the gas impingement zone.

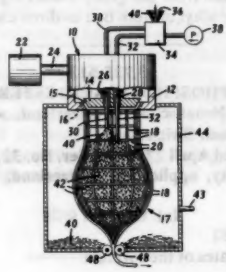
The apparatus employed comprises a vertically-aligned tube which is rotatably mounted in a stationary housing which, together, define an annular plenum chamber located concentrically about the tube. The wall of the rotatable tube defines an aperture which is angled between about 5° and about 90° with respect to the axis of the tube so that a stream of gas flowing therethrough is centered on the vertical axis of the rotatable tube along which liquid metal is gravity flowed from a pour cup positioned above the rotatable tube. As the latter is rotated, a gas is flowed into the plenum chamber and through the angled tube aperture to strike the liquid metal stream flowing downwardly through the tube. The resulting fine metal particles are collected after solidification in a chamber placed below the rotatable tube.



3,725,518
METHOD FOR PRODUCING A TUBULAR NET PRODUCT

Bernard J. Gaffney, Stillwater, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Sept. 29, 1970, Ser. No. 76,417
Int. Cl. B29d 7/24, 9/08; B32b 5/16
U.S. Cl. 264—24 **15 Claims**

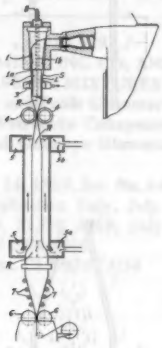


A method is provided for producing a polymer product by extruding a tubular net and applying a finely divided material to the net to form a new product. In one embodiment the finely divided material may at least partially block the openings of the net. When the openings are partially blocked, the product may be biaxially oriented by applying a pressure differential between the interior and the exterior of the product immediately after extrusion. The pressure differential is maintained by the partial blockage of the openings in the extruding net to permanently stretch and orient the net.

3,725,519
PROCESS FOR THE CONTINUOUS PRODUCTION OF MULTIAXIALLY STRETCHED TUBULAR FILMS OF LINEAR POLYESTERS

Walter Seifried, and Ludwig Klenk, both of Wiesbaden-Biebrich, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Continuation of Ser. No. 433,640, Feb. 18, 1965, abandoned. This application Nov. 18, 1969, Ser. No. 871,686
Claims priority, application Germany, Feb. 21, 1964, R 52170
Int. Cl. B29d 7/24; B29c 25/00; B29d 23/04
U.S. Cl. 264—25 5 Claims

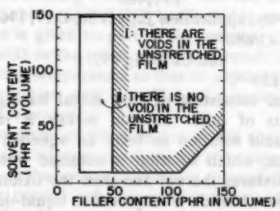


This invention relates to a process for the continuous production of a multiaxially stretched tubular film of a thermoplastic linear polyester having a low melt viscosity by extruding a melt of the polyester in a substantially vertically downward direction from an annular die at a speed v_0 onto an interior calibrating core of a diameter smaller than that of the die while stretching the melt in the longitudinal direction, cooling the melt to form a substantially unoriented tube which engages the core in a gas-tight manner, conveying the tube at a speed $v_1 > v_0$ to a heated stretching zone in which the tube is heated to stretching temperature, stretching the tube by means of a further increase in linear speed $v_2 > v_1$ and by increasing the pressure in the tube, and cooling the tube.

3,725,520
METHOD FOR PREPARING A POROUS SYNTHETIC THERMOPLASTIC FILM OR SHEET

Shigemasa Suzuki, Todashi, and Kozo Nakamura, Iwakunishi, both of Japan, assignors to Nippon Ekika Seikei Kabushiki Kaisha and Sanyo Pulp Kabushiki Kaisha, both of Tokyo, Japan

Filed April 24, 1970, Ser. No. 31,560
Int. Cl. B29d 7/24, 27/00
U.S. Cl. 264—41 11 Claims



A method for preparing a porous film or sheet, which comprises admixing together 100 parts by volume of at least one thermoplastic resin, 5 – 150 parts by volume of a solvent, and 20–50 parts by volume of a filler, uniformly dispersing the solvent and the filler in said resin to thereby form a stock, molding a film or sheet from the resulting stock, biaxially stretching the film or sheet at a suitable temperature between the glass transition temperature of the resin and the flow temperature of the resin, and substantially removing the solvent from the film or sheet during the period between the molding and the end of the stretching without foaming.

3,725,521
METHOD OF MAKING STEEL POWDER PARTICLES OF SELECT ELECTRICAL RESISTIVITY

Hilmer F. Ebling, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

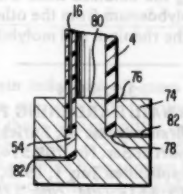
Filed Oct. 29, 1970, Ser. No. 85,240
Int. Cl. B22f 9/00
U.S. Cl. 264—104 5 Claims

A method of making a compressed steel powder article having high resistivity to be used as an electrical component. Steel powder having a particle size finer than 28 mesh is treated with a non-aqueous solution of an organic thermosetting resin to coat the particles with the resin. After evaporation of the solvent and curing of the resin, the coated particles are compressed to form a non-sintered, compressed steel powder article having high electrical resistivity. The compressed article can be subsequently heated to an elevated temperature to stress relieve the article and stabilize the resistivity.

3,725,522
METHOD OF MANUFACTURE OF BALLOON-TYPE CATHETERS

David S. Sheridan, Argyle, and Isaac S. Jackson, Greenwich, both of N.Y., assignors to David S. Sheridan, Argyle, N.Y.

Division of Ser. No. 860,278, Oct. 23, 1969, Pat. No. 3,615,793. This application July 12, 1971, Ser. No. 161,878
Int. Cl. B29c 1/14
U.S. Cl. 264—138 4 Claims



The distal ends of plastic catheters, particularly endotracheal tubes, that have both a major lumen and a secondary lumen in the wall are finished to seal the secondary lumen at its distal end and create an angled distal end on the catheter with a smooth convex surface tip by a molding operation preformed in a vented mold structured to maintain the full opening of the major lumen in the finished distal end.

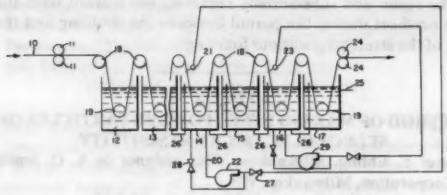
3,725,523
PROCESS FOR EXTRACTING AND DRAWING A TOW

Braxton C. Bowen, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 3, 1971, Ser. No. 168,616
Int. Cl. D02j 1/22; D06c 1/00; D01f 3/06
U.S. Cl. 264—210 F 3 Claims

An improved process for extracting impurities from synthetic filaments which comprises passing the filaments in the form of a tow, which is simultaneously being drawn,

through a series of extraction baths, wherein a portion of the liquor from any given bath is recycled and sprayed with high



impact on the fibrous tow at a point above the surface of the bath.

3,725,524

RHENIUM AND MOLYBDENUM SEPARATION FROM SULFIDE ORES

Brice E. Martin, and Martin B. MacInnis, both of Towanda, Pa., assignors to GTE Sylvania, Incorporated, Seneca Falls, N.Y.

Filed May 19, 1972, Ser. No. 255,011

Int. Cl. C01g *39/00, 47/00;* C22b *49/00, 61/00*

U.S. Cl. 423—49 **5 Claims**

A process is disclosed for the initial removal of rhenium and other metallic impurities from a sulfide bearing molybdenite ore. A relatively small amount of the molybdenum remains with the rhenium while a major portion is dissolved in water. The rhenium and this portion of the molybdenum are recovered from the other metallic impurities. The process does not evolve sulfur dioxide thus eliminates a potential air pollution problem. The process comprises reacting the ores with at least about 15 percent excess of the amount of alkali metal carbonate theoretically required to convert the molybdenum and sulfur in the ore to water soluble compound under controlled temperatures, leaching 95 percent of the molybdenum from the resulting fusion mass, oxidizing the leached fusion mass, treating the oxidized mass with water to extract the rhenium and molybdenum from the other metallic impurities and recovering the rhenium and molybdenum.

3,725,525

HAIR AND NAIL HARDENING PROCESS

Bernhard Joos, Kurfirstenstrasse 23, Zurich, Switzerland

Continuation-in-part of Ser. No. 708,514, Feb. 27, 1969, abandoned. This application July 1, 1970, Ser. No. 51,678

Int. Cl. A61k *7/04, 7/06, 27/00*

U.S. Cl. 424—61 **5 Claims**

Cosmetic compositions and methods of applying the same are provided wherein the compositions contain 1–15 percent of dimethylolalkyleneurea or dimethylolalkylenethiourea as the primary active ingredient dispersed in a compatible carrier conducive to the application of the cosmetic composition in cosmetically effective amounts.

3,725,526

PROCESS FOR PRODUCING PIGMENT QUALITY TITANIUM DIOXIDE

Giovanni Pieri; Aldo Ducato, both of Novara, Italy; Llewellyn John Held, Palmerton, Pa., and Gianfranco Bedetti, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy and The New Jersey Zinc Co., New York, N.Y.

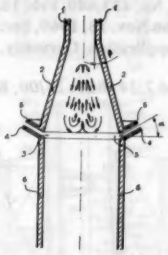
Filed Aug. 17, 1970, Ser. No. 72,561

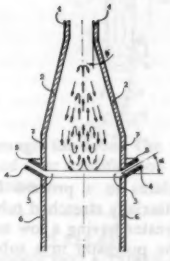
Claims priority, application Italy, Aug. 29, 1969, 21066 A/69

Int. Cl. C01g *23/04*

U.S. Cl. 423—613 **3 Claims**

A reactor for producing finely divided particles of rutile titanium dioxide including a cylindrical reaction chamber, an outwardly diverging frusto-conical duct having an oxidizing gas inlet at its narrow upstream end and a length of between 0.5 and 10 times the diameter of the reaction chamber, an annular slot for introducing titanium tetrachloride into the device at an angle of 0° to 45° to a perpendicular to the lon-





gitudinal axis of the reactor, the slot being located downstream of the divergent duct, the reaction chamber being downstream of the slot and coaxial with the divergent duct. The invention is also related to a method of producing titanium dioxide by oxidizing titanium tetrachloride in a reactor of the type above described.

3,725,527

PROCESS FOR RECOVERING PURE AQUEOUS SOLUTION OF FERRIC CHLORIDE AND AQUEOUS SOLUTION OF METAL CHLORIDES FREE OF FERRIC CHLORIDE FROM FERROUS METAL MATERIAL

Toshio Yamamura; Yuichi Omote; Shiro Sato, and Tomochika Hiyama, all of Kanai, Japan, assignors to Kanto Denka Kogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 858,173, Sept. 15, 1969, Pat. No. 3,622,269. This application Oct. 21, 1971, Ser. No. 191,489

Claims priority, application Japan, Sept. 19, 1968, 43/67838; Sept. 20, 1968, 43/68070

Int. Cl. C01g *49/10*

U.S. Cl. 423—139 **3 Claims**

Iron material consisting of iron metal having associated minor amounts of other noniron metals is reacted with hydrochloric acid solution to form an aqueous solution of metal chlorides, which solution is oxidized with oxygen or chlorine, or mixtures thereof and then the oxidized solution containing ferric chloride is subjected to liquid-liquid contact with an alkyl, aryl or aralkyl ketone or ether having four to 10 carbon atoms so that the ferric chloride is transferred to the organic extract phase, leaving the noniron metal chlorides in the aqueous raffinate, and back-extracting the organic extract with an aqueous medium and separating the thus obtained aqueous extract solution of ferric chloride.

3,725,528

QUANTITATIVE ION EXCHANGE PROCESS FOR CLAY

Amos Banin, Rehovot, Israel, assignor to Yissum Research Development Company of the Hebrew University of Jerusalem

Filed Feb. 18, 1971, Ser. No. 116,640
Int. Cl. C01b *33/28*
U.S. Cl. 423—112 16 Claims

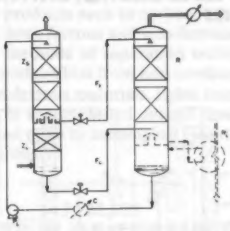
A quantitative ion exchange process for preparing modified clay is disclosed. Clay such as montmorillonite is converted (1) to an acid-free hydrogen-clay by use of an anion (hydroxide) exchange resin; or (2) to another cationic form such as lithium-clay by use of an anion (hydroxide) exchange resin and an equivalent amount of the exchanging cation.

3,725,529

PROCESS FOR ELIMINATING CO_2 AND/OR H_2S FROM GASEOUS MIXTURES

Guiseppe Giammarco, and Paolo Giammarco, both of Venice, Italy, assignors to Vetrocoke Cokapuania S.p.A., Venezia Porto Marghera and Guiseppe Giammarco, Venice, Italy, part interest to each

Filed July 14, 1969, Ser. No. 841,526
Claims priority, application Italy, July 13, 1968, 52432 A/68; April 23, 1969, 51554 A/69; July 18, 1968, 52497 A/68; April 19, 1968, 51504 A/68
Int. Cl. B01d *53/34*
U.S. Cl. 423—223 5 Claims



A process for eliminating CO_2 and/or H_2S from gaseous mixtures containing them by means of an absorbent aqueous solution circulated between an absorption phase and a regeneration phase. Gases produced at very high temperature, as in steam reforming or shift conversion, are placed in direct, intimate contact with the absorbing solution to provide heat for regeneration purposes rather than supplying the heat to conventional reboilers of the regeneration columns in the prior art. The process insures that the heat yielded at the absorption step does not interfere with the chemical absorption of CO_2 by subdividing the absorber into two zones, in which the chemical absorption of CO_2 is effected in one and the heat from the gas is given to part of the solution (or to another aqueous liquid) in the other zone. As a result, the solution is heated to a high temperature so that on expanding the solution at the regeneration step, a sufficient quantity of steam for regeneration is evolved.

The temperature of this solution at the absorption step is prevented from rising excessively be removing from the absorber part of the solution which is expanded and thereby cooled. This cooled solution is then returned to an intermediate level in the absorber in order to absorb further quantities of CO_2 and further quantities of heat.

The solution from the absorber which has been heated by the hot gases is expanded by a gradual progressive flash which is of considerably higher efficiency than the conventional simple instantaneous flashing.

3,725,530

METHOD OF REMOVING MERCURY VAPOR FROM GASES

Buntaro Kawase, Tokyo; Iwao Kojima, and Kunio Otani, both of Kawasaki, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Jan. 18, 1971, Ser. No. 107,576
Claims priority, application Japan, June 23, 1970, 45/54089
Int. Cl. B01d *53/34*
U.S. Cl. 423—210 7 Claims

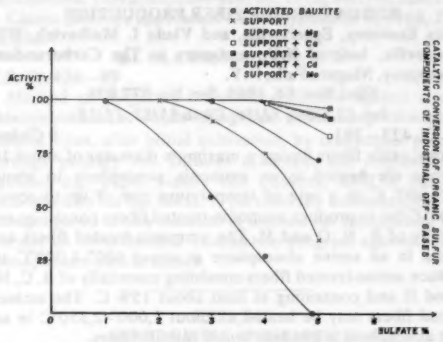
Mercury vapor contained in various gases, e.g., byproduct hydrogen gas generated by a mercury electrolytic cell producing caustic soda, is removed by a simple and effective method which comprises washing the mercury vapor contaminated gas with a dilute acid solution containing persulfate ions.

3,725,531

CATALYTIC CONVERSION OF ORGANIC SULFUR COMPONENTS OF INDUSTRIAL OFF-GASES

Michael J. Pearson, Pleasanton; Orrie C. Olsen, Walnut Creek, and James F. Murphy, Danville, all of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 22, 1971, Ser. No. 117,393
Int. Cl. B01d *53/34*
U.S. Cl. 423—244 10 Claims



A process wherein industrial off-gases containing organic sulfur components are contacted with an alumina base catalyst to convert these organic sulfur components to easily removable compounds such as CO_2 and S. The catalysts employed comprise an alumina base support in combination with at least one metal selected from strontium, calcium, magnesium, zinc, cadmium, barium and molybdenum employed as promoters. The catalysts have significantly increased service life due to the high resistance to sulfate poisoning.

3,725,532

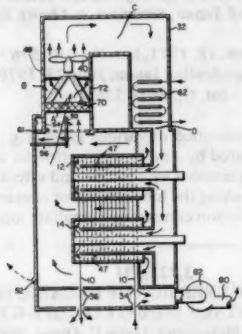
PROCESS FOR REMOVING OXIDIZABLE FUMES FROM HEATED AIR USED TO TREAT TEXTILE FIBERS

Harold Fernandes, and William Henry Walsh, both of Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 812,506, Sept. 18, 1968, abandoned, which is a continuation-in-part of Ser. No. 706,816, Feb. 20, 1968, abandoned. This application Sept. 9, 1970, Ser. No. 70,653
Int. Cl. B01d *53/34*
U.S. Cl. 423—245 3 Claims

In a process for heat treating textile filamentary structures having a textile finish containing oxidizable components wherein a portion of said components are undesirably vaporized, the improvement for removing at least a portion of said vaporized components comprising directing said components through a gas-permeable structure having an oxida-

tion catalyst for said textile finish in a finely dispersed form on the structure to oxidize said components to a more desirable state at about the same temperature range used to treat the



textile structure. Specific oxidation catalysts disclosed are palladium and platinum. The process can operate at extremely high space velocities making the process feasible from an economic viewpoint.

3,725,533

BORON CARBIDE FIBER PRODUCTION

James Economy, Eggertsville, and Vlado I. Matkovich, Williamsville, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Nov. 14, 1969, Ser. No. 877,036
Int. Cl. C01b *31/36*; C04b *35/52, 35/58*
U.S. Cl. 423—291 **9 Claims**

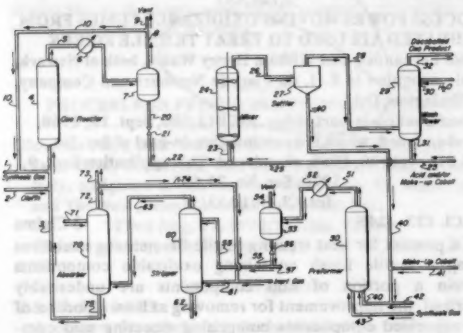
Boric oxide fibers having a maximum diameter of about 10 microns are heated in an ammonia atmosphere to about 350°–600° C at a rate of temperature rise of up to about 5,000° C/hr. to produce ammonia-treated fibers consisting essentially of B, N, O and H. The ammonia-treated fibers are heated in an amine atmosphere at about 600°–1,000°C to produce amine-treated fibers consisting essentially of B, C, N, O and H and containing at least about 15% C. The amine-treated fibers may be heated at about 2,000°–2,350°C in an inert atmosphere to produce boron carbide fibers.

3,725,534

METHOD OF FORMING COMPLEX COBALT CARBONYL COMPOUNDS

John C. Reisch, Cranford, N.J., assignor to Esso Research and Engineering Company

Continuation-in-part of Ser. No. 774,452, Jan. 18, 1968, abandoned. This application March 10, 1969, Ser. No. 814,493
Int. Cl. C01g *1/04, 51/02*
U.S. Cl. 423—417 **12 Claims**



Complex cobalt carbonyl compounds containing a cobalt tetracarbonyl ($Co(CO)_4^-$) anion are formed in the aqueous phase through the reaction of a cobalt material with carbon monoxide in the presence of hydrogen, a noble metal catalyst and a promoter. Useful promoters include alkali and alkaline earth metal compounds, in particular alkali and alkaline earth salts of weak acids, ammonium compounds, amine compounds and quaternary ammonium compounds. The complex cobalt carbonyl compounds thus formed can be converted to useful oxonation catalysts by contacting the same with a mineral acid.

3,725,535

MANUFACTURE OF BASIC CUPRIC COMPOUNDS

James E. Barker, Freehold, N.J., assignor to Cities Service Company, New York, N.Y.

Filed Oct. 22, 1970, Ser. No. 83,214
Int. Cl. C01b *31/24*
U.S. Cl. 423—419 **4 Claims**

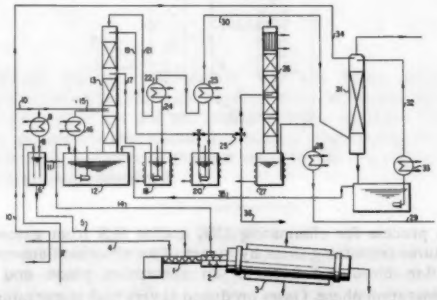
Copper chemicals can be prepared from cuprous oxide by aerating a suspension of cuprous oxide in an appropriate medium. Thus, tribasic copper sulfate, a fungicide, can be prepared by aerating a suspension of cuprous oxide in an aqueous solution of copper sulfate.

3,725,536

METHOD OF THE CONTINUOUS PRODUCTION OF HYDROFLUORIC ACID

Renato Gentili, Rothausstrasse, Muttenz, Switzerland

Continuation-in-part of Ser. No. 708,310, Feb. 26, 1968, Pat. No. 3,574,557. This application Nov. 13, 1970, Ser. No. 89,270
Int. Cl. C01b *7/22*; C01f *11/46*
U.S. Cl. 423—485 **3 Claims**



A method for the continuous production of hydrofluoric acid by the purification and condensation of the hot reaction gases created by the reaction between fluorspar and sulphuric acid, comprising leading the hot reaction gases, already freed from dust, to a scrubbing and stripping column where recycled washing acid absorbs heat and impurities, and from which the gases strip at the same time hydrogen fluoride. The still hot gases are then led to a scrubbing section, employing first impure hydrofluoric acid and then pure hydrofluoric acid, which absorbs further impurities in exchange for which pure hydrogen fluoride is stripped. The cooled gases go then to a fractional condensation stage, where substantial amounts of hydrofluoric acid of industrial purity are collected and volatile impurities, with some hydrogen fluoride are bled off to conventional absorption with fresh sulphuric acid, which HF-laden gas is then led to the scrubbing and stripping column where it absorbs heat and further impurities and from which the hot incoming reaction gases strip hydrogen fluoride. The hot washing acid then continuously overflows to the mixing tank and supplies the acid required for the continuous reaction producing the hydrofluoric reaction gases.

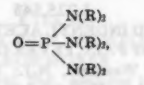
3,725,537

PROCESS FOR THE OXIDATION OF HYDROGEN SULFIDE TO ELEMENTARY SULFUR

Gerhard Schulze, Ludwigshafen, and Wolfgang Heck, Viernheim, both of Germany, assignors to Badische Anilin-Soda-Fabrik Aktiengesellschaft, Ludwigshafen am/Rhine, Germany

Filed Feb. 19, 1971, Ser. No. 117,093
Int. Cl. C01b *17/04*
U.S. Cl. 423—575 8 Claims

In the oxidation of hydrogen sulfide with oxygen or sulfur dioxide in a solvent, there is used as solvent a triamide of orthophosphoric acid of the general formula



where R denotes a hydrogen atom and/or an alkyl group having up to 3 carbon atoms.

3,725,538

PRODUCTION OF CARBON FROM WASTE MATERIALS

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

Filed April 20, 1970, Ser. No. 29,987
Int. Cl. C01b *31/02*
U.S. Cl. 423—449 2 Claims

A waste materials processing system and method sometimes involving material recycling, which converts solid waste materials, such as household garbage, demolition debris, and so forth, to usable products such as carbon, ash as lightweight aggregate, metals, both ferrous and non-ferrous, and inert fill material. Various methods of separation techniques are applied to separate combustibles from non-combustibles, ferrous materials from non-ferrous materials, lights from heavies, and liquid from solids, to accomplished desired results. Floatation techniques are relied upon to accomplish essential separations as hereinafter described.

3,725,539

PREPARATION OF ALKALINE EARTH METAL TITANATE

Stanley F. Spangenberg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed April 28, 1971, Ser. No. 138,340
Int. Cl. C01g *23/00*
U.S. Cl. 423—598 7 Claims

An alkaline earth metal titanate is prepared by reacting an aqueous solution of titanium tetrachloride, an alkaline earth metal anion source, and a hydroxyl ion source to produce an alkaline earth metal titanate precipitate which is separated from the residual aqueous solution.

3,725,540

COLOR AND ODOR STABILIZED DRY AEROSOL ANTIPERSPIRANT

Errol H. Wahl, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 30, 1970, Ser. No. 59,691
Int. Cl. A61k *7/00*
U.S. Cl. 424—46 1 Claim

Dry aerosol antiperspirant compositions containing hexachlorophene and/or perfumes which are subject to deterioration and are stabilized by the incorporation of a small amount of citric acid.

ERRATUM

For Class 424—61 see:
Patent No. 3,725,525

3,725,541

TREATMENT OF DIARRHEA USING AN INSOLUBLE HOMOPOLYMER OF VINYLPYRROLIDONE

Andre Queuille, Noisey-Le-Sec, and Raymond Larde, Coubron, both of France

Continuation of Ser. No. 738,844, June 21, 1968, abandoned. This application Jan. 12, 1971, Ser. No. 105,967
Claims priority, application France, June 23, 1967, 67111715
Int. Cl. A61k *27/00*
U.S. Cl. 424—80 2 Claims

Novel anti-diarrhea and anti-ulcergenic compositions comprising an effective amount of a water-insoluble polymer or copolymer of vinylpyrrolidone and a pharmaceutical carrier.

3,725,542

INTRAMUSCULAR VACCINATION PROGRAM AND VACCINE AGAINST RHINOPNEUMONITIS AND PROCESS FOR PREPARING IT

Anton Mayr, Munich; Kurt Wagener, Hannover; Johann Ditrich Adolf Heinrich Pette, deceased, Munich (by Christiane Wilhelmine Pette, administratrix), and Klaus Petzoldt, Freiburg/Breisgau, all of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Germany

Continuation-in-part of Ser. No. 166,260, July 26, 1971, which is a continuation of Ser. No. 804,742, March 4, 1969, abandoned. This application Jan. 24, 1972, Ser. No. 220,456
Claims priority, application Germany, March 6, 1968, P 16 92 043.7
Int. Cl. C12k *9/00, 7/00, 5/00*
U.S. Cl. 424—89 4 Claims

Method of preparing a vaccine effective against equine rhinopneumonitis which comprises attenuating rhinopneumonitis virus, after initial cultivation, by continuous passage through primary cell cultures of tissues not originating in *equidae*, e.g. piglet kidney cell cultures, until it has lost pathogenicity for the horse. A parenterally administrable vaccine prepared in this manner. A method for immunizing horses and an intramuscular vaccination program against equine rhinopneumonitis in horses.

3,725,543

SYNERGISTIC ANTIBIOTICS

Edward Alexander Konopka, Murray Hill, N.J., and Justus Melchior Gelzer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 81,112, Oct. 20, 1970, which is a continuation-in-part of Ser. No. 13,788, Feb. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 809,967, March 24, 1969, Pat. No. 3,644,616. This application Dec. 8, 1971, Ser. No. 206,185
Int. Cl. A61k *21/00*
U.S. Cl. 424—114 6 Claims

Rifamycines or their semisynthetic derivatives, in combination with other antibiotics selected from oligosaccharides, tetracyclines, amphenicols, macrolides or peptides exhibit synergistic effects against pathogens.

3,725,544

FUNGICIDE FOR PROTECTING WOOD

Paul Raff, Ludwigshafen; Wolfgang Reuther, Heidelberg; Harro Petersen, Frankenthal, and Ernst-Heinrich Pommer, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Land Rhineland-Pfatz, Germany

Filed Dec. 9, 1969, Ser. No. 883,639
Int. Cl. A01n *11/00*
U.S. Cl. 424—154 6 Claims

A fungicide for protecting wood comprising an aqueous solution of an alkali metal hydroxide, a metal hydroxide forming hydroxo anions, and an alkali metal salt of ammonium salt of N-nitroso-N-cyclohexylhydroxylamine, and a process for

protecting wood against fungus attack by treatment with this fungicide.

3,725,545

ENHANCEMENT OF ANTIBODY PRODUCTION BY NUCLEIC ACID-POLYCATION COMPLEXES

Roland Maes, C.P.F.A., Caixa Postal 589-ZC-00, Rio De Janeiro, Brazil

Filed Feb. 3, 1971, Ser. No. 112,372
Int. Cl. C12r 5/00
U.S. Cl. 424—180 **8 Claims**

Complex substances capable of enhancing the production of antibodies when introduced in conjunction with an antigen into an animal host are produced by reacting single-stranded or multi-stranded nucleic acid polymers with cationically charged polymers having a molecular weight between about 10^3 and 10^8 in specified proportions, e.g., 50 parts of nucleic acid polymer to 1 part to 500 parts cationic polymer by weight.

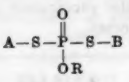
3,725,546

CERTAIN PHOSPHORODITHIOLATES AS INSECTICIDES AND FUNGICIDES

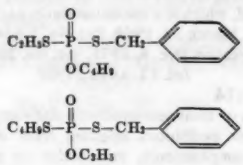
Hiroshi Tsuchiya, Ashiya; Kunio Mukai, Nishinomiya; Akio Kimura, Takarazuka; Keimei Fujimoto, Kyoto; Toshiaki Ozaki; Sigeo Yamamoto, both of Toyonaka; Yositosi Okuno, Nishinomiya; Taizo Ogawa, Minoo; Toshiyuki Wakatsuki, Kyoto, and Yoshihiko Nishizawa, Nara, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 690,725, Dec. 15, 1967, abandoned. This application Aug. 5, 1970, Ser. No. 61,468
Int. Cl. A01n 9/36
U.S. Cl. 424—225 **6 Claims**

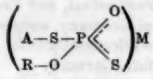
Method for controlling insects and fungi, in which the insects and fungi are contacted with a phosphorodithiolate of the formula,



wherein R is a lower alkyl; A is a lower alkyl, etc.; and B is phenylalkyl, etc. Two typical examples of the phosphorodithiolates are shown by the formula



The compounds can be prepared by condensing a dithioate of the formula,



wherein A and R are as mentioned above and M is an alkali metal or ammonium group, with a halide of the formula,

B · Hal

wherein B is as mentioned above and Hal is a halogen.

3,725,547

SYNERGISTIC ANTIBACTERIAL COMBINATION

John A. Kooistra, Forest Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 8, 1970, Ser. No. 79,271
Int. Cl. A01n 9/00
U.S. Cl. 424—245 **1 Claim**

Antibacterial compositions containing a combination of the zinc salt of 1-hydroxy-2-pyridinethione and 2,4,4'-trichloro-2'-hydroxydiphenyl ether, in a ratio of from about 9:1 to about 1:9 respectively, said combination possessing a synergistic activity permitting use at low concentrations.

3,725,548

SUBSTITUTED INDENYL ACETIC ACIDS IN THE TREATMENT OF PAIN, FEVER OR INFLAMMATION

Tsung-Ying Shen, Westfield, N.J.; Richard B. Greenwald, Framingham, Mass.; Howard Jones, Holmdel, N.J.; Bruce O. Linn, Somerville, N.J., and Bruce E. Witzell, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 33,891, May 1, 1970, Pat. No. 3,654,349, which is a continuation-in-part of Ser. No. 848,736, Aug. 8, 1969, abandoned. This application Oct. 6, 1971, Ser. No. 187,197
Int. Cl. A61k 27/00
U.S. Cl. 424—303 **20 Claims**

New substituted indenyl acetic acids and nontoxic pharmaceutically acceptable amides, esters and salts derived therefrom. The substituted indenyl acetic acids disclosed herein have anti-inflammatory, anti-pyretic and analgesic activity. Also included herein are methods of preparing said indenyl acetic acid compounds, pharmaceutical compositions having said indenyl acetic acid compounds as an active ingredient and methods of treating inflammation by administering these particular compositions to patients.

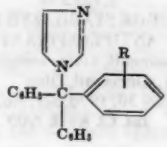
3,725,549

N-TRITYL-IMIDAZOLES FOR CONTROLLING PLANT FUNGI

Karl-Heinz Buchel, Wuppertal-Elberfeld; Erik Regel, Wuppertal-Cronenburg; Ferdinand Grewe, Bursheid; Hans Scheinpflug, and Helmut Kaspers, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 789,601, Jan. 7, 1969, abandoned, and a continuation of Ser. No. 789,602, Jan. 7, 1969, abandoned. This application Sept. 13, 1971, Ser. No. 180,105
Claims priority, application Germany, Jan. 29, 1968, P 16 70 976.5; Jan. 29, 1968, P 16 70 977.6
Int. Cl. A01n 9/22
U.S. Cl. 424—273 **22 Claims**

Plant fungicial compositions are produced which comprise an amount of a compound of the formula:



(I)

wherein

R is chloro, bromo or fluoro, or a salt thereof, sufficient to be effective for killing, combatting or controlling plant fungi, in combination with a solid or liquid diluent or carrier. Methods for killing, combatting or controlling fungal diseases in plants comprise applying to the fungi or to the plant to be protected an effective or toxic amount of the above compound.

3,725,550

PYRROLE DERIVATIVE FUNGICIDAL AGENTS AND TREATMENTS

Roger P. Napier, Bridgewater Township, Somerset City, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 15, 1970, Ser. No. 98,486
Int. Cl. A01n *9/22*; A61k *27/00*
U.S. Cl. 424—274 9 Claims

Fungicides containing an N-alkyl-trichloroacetylpyrrole as the active component are highly effective in combating soil fungi, as exemplified by inhibiting the development of Pythium disease on cotton crops by pretreating soil with N-methyl-2-trichloroacetylpyrrole.

3,725,551

INSECT CONTROL PROCESS WITH SYNTHETIC HORMONES

William S. Bowers, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture

Division of Ser. No. 788,651, Jan. 2, 1969, Pat. No. 3,563,982. This application Nov. 10, 1970, Ser. No. 88,495
Int. Cl. A01n *9/28*
U.S. Cl. 424—282 29 Claims

Methylenedioxybenzyloxy and methylenedioxyphenoxy ethers of straight chain terpenoid compounds and their epoxides were synthesized and found to mimic the juvenile hormones of insects and be extremely effective control agents.

3,725,552

METHOD OF PRODUCING NASAL VASOCONSTRICTION

Froilan P. Luduena, Albany, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 720,362, April 10, 1968, abandoned. This application Oct. 28, 1970, Ser. No. 84,887
Int. Cl. A61k *27/00*
U.S. Cl. 424—330 3 Claims

Method of producing nasal vasoconstriction in a warm-blooded mammal by oral administration of an ar-amio alcohol, preferably the m-amino species.

3,725,553

METHOD FOR ACTIVATING THE BLOOD FIBRINOLYSIS BY ADMINISTRATION OF 2-AMINO-ETHANESULPHONIC ACID OR SALTS THEREOF

Alberto Giotti, No. 15 via Trento, and Federigo Sicuteri, No. 17a via J. Nardi, both of Firenze, Italy

Filed April 15, 1970, Ser. No. 28,588
Claims priority, application Italy, Feb. 23, 1970, 48769 A/70
Int. Cl. A61k *27/00*
U.S. Cl. 424—315 3 Claims

A method for activating the fibrinolysis of blood by administration of a pharmaceutical compound consisting of 2-amino-ethane-sulphonic acid or a salt thereof and a pharmaceutical carrier therefor. The salts of taurine with inorganic and organic bases releasing Na+, K+, Ca++, Mg++ ions as well with diethylamine, morpholine and like are suited thereto.

3,725,554

BENZIMIDAZOLE COMPOUND, METHOD OF USE, AND COMPOSITIONS

Dennis Ernest Burton; Geoffrey Tattersall Newbold, both of Saffron Walden; Albert Percival, Hauxton; Alan James Lambie, Kidderminster, and Ian Robert Sencial, Rubery, all of England, assignors to Fisons Limited, London, England

Division of Ser. No. 631,175, April 17, 1967, which is a continuation-in-part of Ser. No. 457,519, May 20, 1965, abandoned. This application Nov. 15, 1971, Ser. No. 199,018
Int. Cl. A01n *9/22*
U.S. Cl. 424—273 5 Claims

5,6-Dichloro-1-phenoxycarbonyl-2-trifluoromethyl-benzimidazole finds particular use as an acaricide.

3,725,555

BACTERICIDAL COMPOSITIONS AND METHOD OF KILLING BACTERIA USING BIS-(PHENOXYPHENYL) CARBONATES

Walter Traber, Riehen, and Anton G. Weiss, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 747,792, July 26, 1968, Pat. No. 3,592,837. This application Dec. 30, 1970, Ser. No. 102,991
Claims priority, application Switzerland, Aug. 1, 1967, 10854/67
Int. Cl. A01n *9/24*
U.S. Cl. 424—301 7 Claims

Bis-(phenoxyphenyl) carbonates which are unsubstituted or substituted in one or several of their benzene rings by halogen, lower alkyl or trifluoromethyl are disclosed as antibacterial agents.

3,725,556

METHOD OF MANUFACTURING RAPIDLY DISINTEGRATING PHARMACEUTICAL TABLETS

Dieter Hanssen, Rotweinstrasse 24, Ingelheim/am Rhine, and Adolf Knecht, Im Breitle 3/a, Munzingen, both of Germany

Continuation-in-part of Ser. No. 779,269, Nov. 26, 1968, abandoned. This application Nov. 12, 1970, Ser. No. 89,120
Int. Cl. A01n *9/00*
U.S. Cl. 424—357 5 Claims

A method of compounding the inert pharmaceutical carrier ingredients and active drug ingredient of a pharmaceutical tablet composition, which circumvents the conventional granulation step prior to compression in the manufacture of pharmaceutical tablets and results in very rapidly disintegrating tablets; the method consists of

1. spray-drying, after inert gas foaming, a suspension of
   A. 1 – 20 percent by weight of very finely divided silicon dioxide or aluminum oxide and
   B. 60 – 98 percent by weight of at least one fine-grained, inert filler material chosen from the group consisting of selected from the group consisting of substantially water-insoluble rice starch and corn starch and alkaline earth metal phosphates, in an aqueous solution of
   C. 1 – 20 percent of a water-soluble binder,
2. adding the active drug ingredient to the resulting spray-dried, ungranulated tablet pre-mix, and
3. compressing the resulting composition together with the active agent and a tablet lubricant, into pharmaceutical tablets.

3,725,557

ALLOXANTIN COMPOUNDS AS ANTIBACTERIAL AND ANTIFUNGAL AGENTS

John D. Douros, Jr., and Al Fred Kerst, both of Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Aug. 14, 1970, Ser. No. 75,312
Int. Cl. A01n *9/00*, *9/22*
U.S. Cl. 424—251 12 Claims

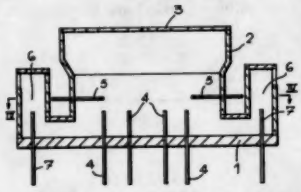
Alloxantin, and alloxantin dihydrate can be used to inhibit and/or prevent the growth of undesirable herbs, bacteria, fungi, and other microorganisms. This invention is particularly concerned with the bacteriostatic and bactericidal properties of alloxantin compounds against *Staphylococcus aureus* and *Xanthomonas phaseoli*.

ELECTRICAL

3,725,558
GLASS FURNACE

Michel Marie Joseph t'Serstevens, 47 residence Le Festinoy, Ghlin, Belgium

Filed May 24, 1971, Ser. No. 146,230
Claims priority, application Belgium, May 22, 1970, 89398
Int. Cl. C03b 5/02
U.S. Cl. 13—6 6 Claims



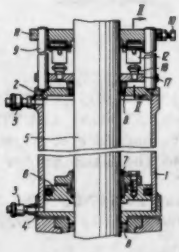
This invention relates to a glass factory kiln comprising principal heating electrodes which transverse the bed and which, by conductivity, produce the thermal energy which, in normal operation, is necessary to keep a glass bath at the desired temperature.

The kiln furthermore involves auxiliary heating electrodes which traverse the side walls and which, in the upper portion of the glass bath, produce a supporting thermal energy which makes it possible to control the upper level of the glass bath and thus the thickness of the compound layer which is on top of this glass bath.

3,725,559
PLASMATRON DRIVE

Konstantin Trofimovich Nautny, ulitsa Krasitskogo, 17, kv. 2; Viktor Iosifovich Lakomsky, ulitsa Bastionnaya, 10, kv. 30; Anatoly Ivanovich Chvertko, bulvar Lesi Ukrainki, 2, kv. 36, all of Kiev; Semen Yakovlevich Shekhter, ulitsa Brestskaya, 15, kv. 18; Alexandr Mikhailovich Reznitsky, ulitsa Kirova, 2, kv. 18, both of Kommunarsk Voroshilovgradskoi oblasti, and Viktor Romanovich Pilipchuk, ulitsa Mashinostroitelnaya, 12, kv. 4, Kiev, all of U.S.S.R.

Filed Nov. 9, 1971, Ser. No. 197,011
Int. Cl. H05b 7/12
U.S. Cl. 13—14 2 Claims

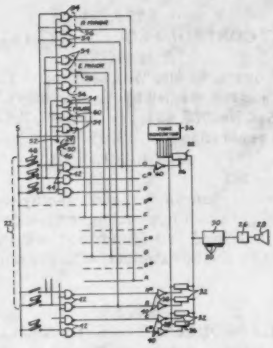


A plasmatron drive wherein the plasmatron is combined with the pneumatic drive rod into an integral unit and the pneumatic drive cylinder is provided with a mechanism for fixing the plasmatron in the upper position.

3,725,560
CHORD PLAYING ORGAN

John W. Robinson, and Billy Joe Whittington, both of Jasper, Ind., assignors to The Jasper Electronics Manufacturing Corporation, Jasper, Ind.

Filed March 9, 1972, Ser. No. 233,077
Int. Cl. G01h 1/00
U.S. Cl. 84—1.01 6 Claims

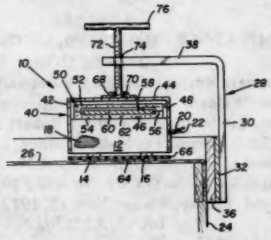


An electronic organ which can be adjusted from playing in a conventional manner to playing in such a manner that at least selected playing keys of the lower manual of the organ will each cause a sounding of a respective chord when actuated. The tone signals from the tone generator of the organ are controlled by keyers and, in one condition of adjustment of the organ, each playing keys controls a single keyer, while in another condition of adjustment thereof, each of a selected group of the playing keys of the lower manual of the organ controls a group of keyers with the keyers pertaining to tones that make up a musical chord. The switching employed in the organ for adjustment thereof from one playing condition to another is by way of d.c. logic and the control of the keyers is also affected by d.c. logic.

3,725,561
METHOD OF ELECTRICALLY REPRODUCING MUSIC AND IMPROVED ELECTRICAL PICKUP FOR PRACTICING THE SAME

Les Paul, Mahwah, N.J., assignor to Gibson, Inc., Kalamazoo, Mich.

Continuation-in-part of Ser. No. 77,946, Oct. 6, 1970, abandoned. This application Sept. 14, 1971, Ser. No. 180,424
Int. Cl. G10h 3/08
U.S. Cl. 84—1.15 3 Claims



Improvements in the electrical reproduction of the audio output of musical instruments having vibrating surfaces

reproducing said audio output, illustrative examples of which are a drum and a guitar. Product aspects of the invention are demonstrated by the use of an improved electrical pickup that is mounted for vibration in unison with the vibrating surface and thus provides a vibrating magnetic field. A field-influencing magnetic body is confined within a compartment of the electrical pickup that is bounded by resilient walls that in practice causes said body to be set into vibration along with the pickup but in an out-of-phase vibratory pattern. The effect of the vibrating magnetic body is to provide a signal-producing movement relative to the magnetic field that effectively results in audio output reproduction.

3,725,562

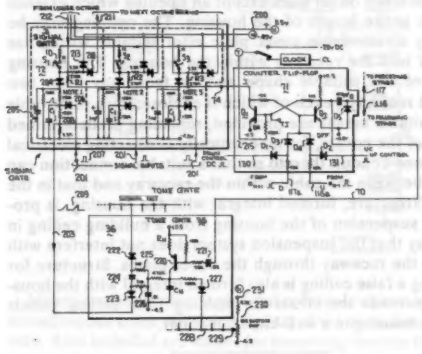
ARPEGGIO SYSTEM FOR ELECTRONIC ORGAN

Walter Munch, Jr., and Richard L. Studer, both of Cincinnati, Ohio, assignors to D. H. Baldwin Company, Cincinnati, Ohio

Filed Aug. 16, 1971, Ser. No. 171,997

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.24 **37 Claims**



An automatic arpeggio system for an electronic organ, in which playing of a chord, or a single note, turns on tone signal gates for the played notes, and, at will, all octavely related notes, and initiates action of an assynchronous up-down multistage counter which sequentially reads out only the turned on gates, in sequence, either in an up-scan only, or up and then down. The gates lead to tone color filters, amplifiers and loudspeakers. Those counter stages which are selected to turn on gates are constrained to act as clock controlled bistable flip-flops, while the remainder act as monostable flip-flops with a time constant of the order of 30 microseconds, so that their set and reset involves inadequate time elapse to effect sounding of a note by closing of a tone gate.

3,725,563

METHOD OF PERSPECTIVE TRANSFORMATION IN SCANNED RASTER VISUAL DISPLAY

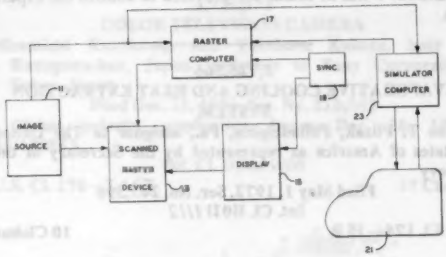
Brian J. Woycechowsky, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Continuation-in-part of Ser. No. 134,238, April 15, 1971, abandoned. This application Dec. 23, 1971, Ser. No. 211,372

Int. Cl. G09b *9/08;* **H04n** *3/30;* **G01s** *7/20*

U.S. Cl. 35—10.2 **19 Claims**

A general method of providing perspective transformations in a visual display system having an image generated by a scanned raster device such as a CRT or television projector is shown. The television display is a window out of which an observer views a simulated picture of terrain. The line of sight from the observer passing through the instantaneous spot position on the window is used to find a ground intersection point, the location of this point on an image source, such as film, is found and a video signal representing that image is generated



by positioning the scan of an image pick up device to that point on the image source.

3,725,564

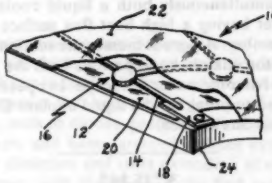
GROUNDED MULTILAYER INSULATION

Robert A. Wiedeman, Los Altos, and Harold L. Hillesland, Fremont, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 23, 1971, Ser. No. 182,970

Int. Cl. H01r *3/06*

U.S. Cl. 174—6 **1 Claim**



A grounded multilayer insulation having a grounding net sandwiched between a layer of insulation and a binder material. The grounding net has at least one grounding tab secured thereto. When attachment of the multilayer insulation takes place the same fastener attaches both the grounding tab and insulation.

3,725,565

EXPANSION MEMBER FOR SUPERCONDUCTING CABLE

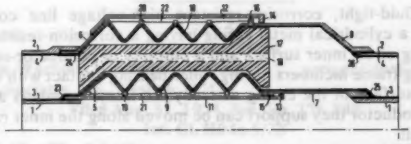
Fritz Schmidt, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed April 21, 1972, Ser. No. 246,155

Claims priority, application Germany, April 22, 1971, P 21 19 696.3

Int. Cl. H02g *15/26;* **H01v** *11/00*

U.S. Cl. 174—13 **11 Claims**



An expansion member for superconducting cable, designed to compensate for the expansion and contraction of the cable, having two corrugated tubes is arranged between the rigid tubes of the superconducting cable with transition sections connecting the corrugated tubes to the rigid tubes. The corru-

gated portions of the expansion member enables the expansion member to expand and contract. Bushings guide such expansion and there are stops provided to limit the amount of expansion. Wires or braids are provided to control the expansion.

3,725,566

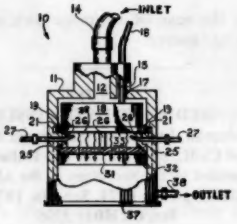
EVAPORATIVE COOLING AND HEAT EXTRACTION SYSTEM

Bruno T. Plizak, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 1, 1972, Ser. No. 247,398

Int. Cl. H01l 1/12

U.S. Cl. 174—15 R **10 Claims**



Heat transfer is accomplished from electronic components by inserting simultaneously both a liquid coolant and a gas into a chamber having a high heat flux surface forming one side of the chamber. A porous membrane section forms on opposite side of the chamber and permits both the gas and a hot vapor formed from the water to escape. In operation the gaseous flow is used to break up the liquid coolant film that forms on the high heat flux surface.

3,725,567

GAS-PRESSURE-INSULATED HIGH-VOLTAGE LINE

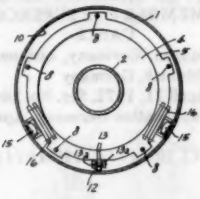
Willi Olsen, and Klaus Schlosser, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft

Filed Sept. 14, 1971, Ser. No. 180,307

Claims priority, application Germany, Sept. 30, 1970, P 20 48 989.8

Int. Cl. H01b 9/06

U.S. Cl. 174—16 B **9 Claims**



A fluid-tight, corrosion-resistant high-voltage line comprises a cylindrical metal casing having a corrosion-resistant coating on its inner surface and a plurality of conductor-supporting frame members having roller bearing contact with the inner surface of the casing whereby the frame members and the conductor they support can be moved along the inner casing wall.

ERRATUM

For Class 174—38 see:
Patents Nos. 3,725,580 and 3,725,581

3,725,568

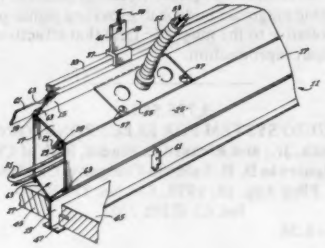
ELECTRICAL CEILING RACEWAY

John Edwin Stanley, La Canada, Calif., assignor to Duo-Flex Corporation, Glendale, Calif.

Filed Dec. 6, 1971, Ser. No. 205,244

Int. Cl. H02g 3/04

U.S. Cl. 174—48 **4 Claims**



An electrical raceway comprising a housing which, in section, is enclosed on all sides except an opening which extends along the entire length of the housing. The opening may be closed by a removable cover plate after suitable wiring has been laid into the raceway within the housing. The housing may be of any suitable shape and, in fact, may form two separated raceways, each of which is enclosed by a removable cover. Suitable means are provided, replacing predetermined portions of the covers, for mechanically connecting electrical or telephone conduit thereto so that a suitable connection can be made between the cable within the raceway and that in the conduit. Structure, formed integral with the housing, is provided for suspension of the housing from a building ceiling in such a way that the suspension system does not interfere with access to the raceway through the cover plates. Structure for supporting a false ceiling is also formed integral with the housing and extends therefrom for holding false ceiling panels below the housing in a well-known manner.

3,725,569

COLOR FACSIMILE TRANSMISSION SYSTEM

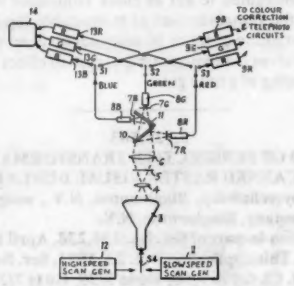
John Vernon Ashworth, Oxshott, and John Hugh Smith, Chorley Wood, both of England, assignors to IPC Services Limited, London, England

Filed Feb. 16, 1971, Ser. No. 115,163

Claims priority, application Great Britain, Feb. 24, 1970, 8951/70

Int. Cl. H04n 9/02, 1/46

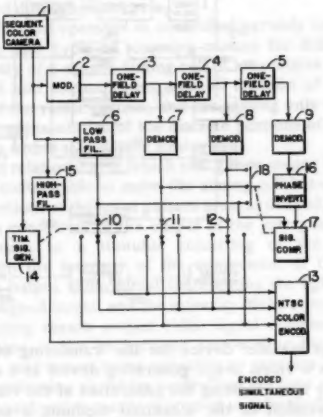
U.S. Cl. 178—5.2 A **10 Claims**



A color transmission system is described for transmitting information representing color separations to a remote point at which the separations are reproduced in a form suitable for making printing plates for reproducing a color picture. A color transparency is scanned by a moving light spot and the light passed by the transparency is directed through a filter for each color component and on to a light sensitive device

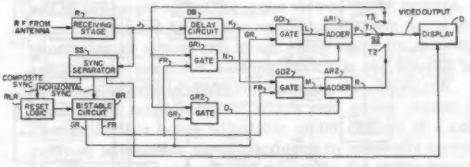
producing an electrical output signal. The electrical signals representative of the color components are transmitted either sequentially or simultaneously to one or more facsimile receiving devices for producing a facsimile image of each of said color components. The system may include color balance circuits and color correction circuits as well as means for generating a black overprint signal.

3,725,570
TELEVISION SIGNAL CONVERTER
William D. Gramling, 6149 Tompkins Drive, McLean, Va.
Continuation-in-part of Ser. No. 780,683, Dec. 3, 1968, abandoned. This application Sept. 30, 1970, Ser. No. 76,679
Int. Cl. H04h *9/50*
U.S. Cl. 178—5.2 R **7 Claims**



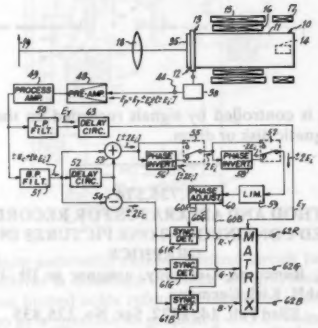
Means for converting sequential color television signals into simultaneous color television signals of the same line and field rate. Also included are means for removing chroma fringing of televised moving objects and means for removing noise from the video or detected error signal to prevent interference of operational thresholds.

3,725,571
MULTIPLEX VIDEO TRANSMISSION SYSTEM
James W. H. Justice, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed June 21, 1971, Ser. No. 155,078
Int. Cl. H04n *9/00, 7/08*
U.S. Cl. 178—5.2 R **5 Claims**



System of receiving a plurality of n-separate pictures wherein every nth line of each of the pictures is selected for transmission beginning at a different line and wherein reception of the selected one of the pictures is accomplished by selecting from the plurality of lines transmitted every nth line commencing at the preselected line, with the selected line being delayed by a medium having a bandwidth less than the bandwidth of the video pictures and recombined with the undelayed selected line so that the selected one of the pictures may be displayed with high-quality resolution.

3,725,572
COLOR TELEVISION CAMERA
Hiromichi Kurokawa, and Yasuharu Kubota, both of Kanagawa-ken, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 21, 1971, Ser. No. 210,342
Claims priority, application Japan, Dec. 26, 1970, 45/128853
Int. Cl. H04n *9/06*
U.S. Cl. 178—5.4 ST **17 Claims**

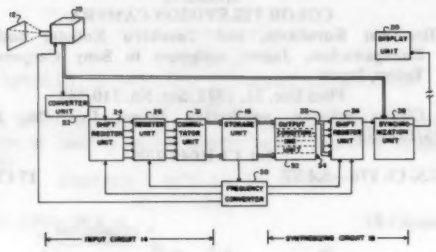


In a color television camera having a target structure which is scanned by an electron beam and on which is projected an image of an object in the field of view of the camera; the target structure comprises first and second groups of photoconductive elements, such as diodes, preferably formed in a semiconductor substrate and being arrayed in lines extending in the line scanning direction and rows extending at substantial angles to the lines, with the lines of the first group of diodes being alternated with the lines of the second group of diodes, color filter elements corresponding to the diodes, respectively, and being disposed between the latter and the object for forming color components of the projected image on the respective diodes, first electrodes connected to the first and second groups, respectively, of the diodes for applying to the latter an alternating signal having phase alternation by line and for picking-up a color video signal corresponding to the projected image in response to the conversion by said diodes of light projected thereon into an electrical output when scanned by the electron beam, and second electrodes arranged generally in the direction of the rows of diodes for receiving an alternating signal having phase alternation by field and for picking-up an index signal corresponding with the arrangement of the second electrodes along the line being scanned and having phase alternation by field. The color video signal and index signal thus formed are combined in a composite signal which is supplied to circuits by which the index signal is employed for deriving the individual color signals from the color video signal.

3,725,573
VIDEO BUFFER
Alan Wachtel, Huntington Station, N.Y., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Aug. 31, 1971, Ser. No. 176,598
Int. Cl. H04n *5/78*
U.S. Cl. 178—6.6 DD **16 Claims**

An image transmission system. A television camera scans a projected image and generates a video signal. An input circuit converts the video signal into a two-level signal which is sampled and stored digitally on a magnetic disk or drum. After the signals are stored, they are used to reconstruct a video signal

by being recombined and combined with blanking, horizontal drive and synchronization signals from the television camera.



All timing is controlled by signals recorded on timing tracks on the magnetic disk or drum.

3,725,574

METHOD AND APPARATUS FOR RECORDING RASTERED CONTINUOUS-TONE PICTURES IN PRINTED GRAPHICS

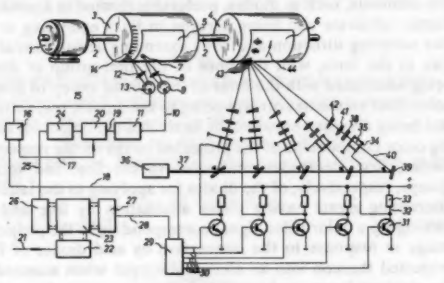
Uwe Gast, Rammsee, Germany, assignor to Dr.-Ing. Rudolf Hell GmbH, Kiel, Germany

Filed Feb. 14, 1972, Ser. No. 225,835

Claims priority, application Germany, Feb. 18, 1971, P 21 07 738.3

Int. Cl. H04n *5/84*

U.S. Cl. 178—6.7 R **20 Claims**



A method of recording half-tone pictures i.e. rastered continuous-tone pictures in printed graphics in which respective covering dots create the recorded picture, with the size of the dots corresponding to the tone value to be depicted thereby in which recordation is effected on a light-sensitive medium by directing thereon polarized light with each covering dot being formed in a respective individual raster field, the area of which field represents approximately the maximum size of a dot, with the path of such light between the source thereof and the recording medium having variable polarization characteristics whereby the amount of light striking the medium may be varied over the raster field and thereby determine the size of the covering dot formed in such raster field with the polarization characteristics of such light path being varied in accordance with the characteristics of the picture to be produced whereby the intensity of the light directed on the medium at the different portions of the raster field it is controlled in dependence upon the size of the dot to be produced for creating the desired tone effect thereat. Apparatus is also provided for practicing the invention utilizing electrically-controllable rotary crystals in combination with polarization filters disposed between such crystals and the recording medium.

3,725,575

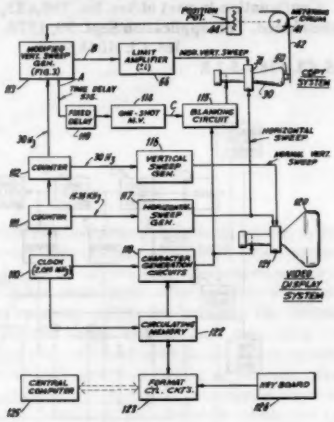
IMAGE TRANSFER DEVICE

Brian E. Dell, Newton, Conn., assignor to Computer Optics, Inc., Bethel, Conn.

Filed May 1, 1970, Ser. No. 33,650

Int. Cl. H04n *5/84*

U.S. Cl. 178—6.7 R **5 Claims**



An image transfer device for the transfering of a video image from a video image generating device to a sensitized medium. By synchronizing the generation of the video image to the movement of the sensitized medium, a continuous transfering mechanism is created.

3,725,576

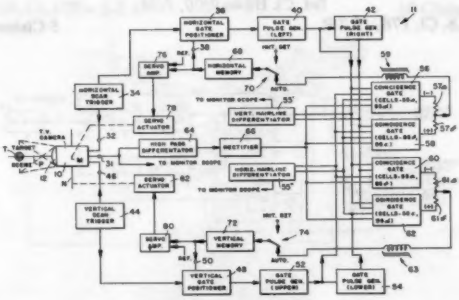
TELEVISION TRACKING SYSTEM

Jack A. Crawford; George R. Lewis, and William H. Woodworth, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 12, 1962, Ser. No. 224,594

Int. Cl. F41b *7/00*; G06f *15/50*

U.S. Cl. 178—6.8 **4 Claims**



1. In a homing missile of the type steered in response to a television camera contained therein, said missile further adapted to be carried by an aircraft for launching against an assigned ground target within a scene viewed by the camera and adapted to be aimed at the target in cooperation with a

television image of the scene displayed by a television viewing device contained within the aircraft, said missile and said aircraft being interconnected prior to launching through a signal relaying means for communicating electrical signals from the missiles to the aircraft, and vice versa, said signal relaying means being adapted to be disconnected upon launching, the combination, comprising;

a. a television camera having a sighting axis and a field of view about said sighting axis and adapted to scan an image of the scene in the field of view of the camera,

said camera being operative to produce a video signal which at each instant of said cycle of scanning motion is representative of the light-tone value of the elemental portion of the image under scan,

said scanning means scanning said image in a predetermined cycle of scanning motion providing a predetermined trace pattern of elemental portions of said image scanned during a scan cycle,

b. gating means operated in controlled variably timed relation to said cycle of scanning motion for defining the geometry of a missile aiming cell of area within the trace pattern and encompassing a small fraction of the total area of the raster pattern, and for passing only the video signal representative of the discrete portions of the trace pattern within said missile aiming cell,

the timed relationship in which said gating means is opened being controllable to move the aiming cell between various portions of the trace pattern area, as desired,

c. means connected to the output of the gating means and responsive to a stimulus consisting of the contrast between the intensity of the component of the gating means output video signal representing the light-tone of the assigned target, and the intensity of the component of the gating means output video signal representing the light-tone of the background surrounding the assigned target, said means being operative to generate an aiming cell positioning signal for controlling the time relation in which said gating means is opened to selectively alter the position of the cell of area to maintain said aiming cell essentially symmetrically disposed about the image of the assigned target,

d. means for generating a missile steering signal in accordance with the displacement of said aiming cell away from a position corresponding to alignment of the aiming cell with the sighting axis of the camera,

e. means operable after the missile is launched for steering the missile in response to said steering signal to alter the missile course in a direction tending to bring the target and the camera sighting axis into alignment to thereby steer the missile along a homing course to the target,

whereby the missile is steered to a target by a combination of a response to the misalignment of symmetry of the aiming cell about the image of the target and a response to the misalignment of the aiming cell relative to the sighting axis of the camera, providing a dynamic range of control action permitting the missile to be controlled to steer itself to any target within the scene viewed by the camera,

f. means responsive to the aiming cell positioning signal for generating an aiming cell image video signal for relaying same to the television viewing device in the aircraft to provide a television image representing the aiming cell,

g. said timed relationship in which said gating means is opened further being adjustable under control of a cell position adjustment signal produced by manually operable means in the aircraft and relayed to the gating means through the interconnecting means,

whereby the missile may be aimed to home toward any desired target in the scene displayed in the aircraft by operation of the manually operable means to bring the television image of the aiming cell into superposition with the television image of the assigned target whereupon the aiming cell will be caused to automatically track the target upon relative movement of the latter in the displayed scene and upon launching the missile will steer itself to the target.

3,725,577

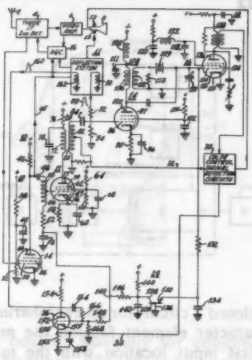
COMMON BASE AMPLIFIER TERMINATING CIRCUIT FOR HIGH IMPEDANCE DETECTING APPARATUS

James M. Yongue, Indianapolis, Ind., assignor to RCA Corporation

Division of Ser. No. 641,759, May 29, 1967. This application Nov. 6, 1970, Ser. No. 87,475

Int. Cl. H04n 5/52

U.S. Cl. 178—7.3 R **2 Claims**



A closed loop automatic chroma control circuit for a color television receiver is disclosed in which the grid leak current of an injection locked color reference oscillator is supplied to a transistor so as to produce an amplified A.C.C. voltage.

3,725,578

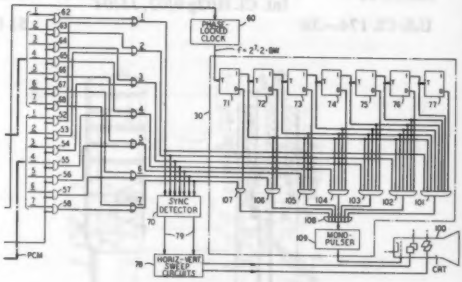
DIGITAL VIDEO RECEIVERS

Earl Franklin Brown, Piscataway, and William Kaminski, West Portal, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 25, 1971, Ser. No. 156,805

Int. Cl. H04n 5/48; H01j 29/52

U.S. Cl. 178—7.5 R **11 Claims**



This disclosure relates to real time, all digital, video receivers wherein a linear light modulation is achieved by means of a "half-tone process." The half-tone process is effected by gating a linearly scanned electron beam with constant amplitude, variable duty cycle pulses. The duty cycle is varied in successive Nyquist intervals in a manner directly related to the binary digit content of the successive n-bit words of a received pulse code modulated (PCM) video signal. For a 7-bit conventional PCM video signal, for example, 128 different levels of light intensity can be provided for each Nyquist interval.

3,725,579

CIRCUIT FOR ENCIPHERING DEVICE

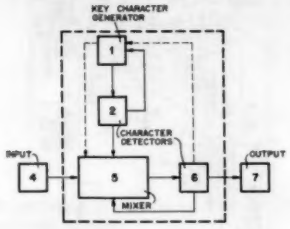
Oskar Edwin Sturzinger, Baar, Switzerland, assignor to Anstalt Europaische Handelsgesellschaft, Vaduz, Liechtenstein

Filed March 10, 1971, Ser. No. 122,969

Claims priority, application Switzerland, March 16, 1970, 3922/70

Int. Cl. H04l 9/00; G09c 1/00

U.S. Cl. 178—22 **2 Claims**



There is disclosed a circuit for an enciphering device which couples in character element fashion the multidigit coded signals of a first input location with the multidigit coded signals of a second input location, comprising at least one character detector operatively associated with a key character generator, which upon the occurrence of a first predetermined character combination at its output is influenced such that it offers a different character combination, and wherein at least one charaCter detector is arranged at the output of the circuit which upon the occurrence of a second predetermined character combination causes the key character generator to deliver a predetermined yet always similar character combination before the second predetermined character combination appearing at the output is released.

3,725,580

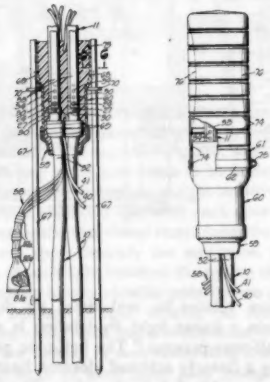
PROTECTIVE CABLE SPLICE ASSEMBLY AND METHOD

John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 2331 20th St., Santa Monica, Calif.

Continuation-in-part of Ser. No. 843,508, July 22, 1969, abandoned. This application Sept. 10, 1970, Ser. No. 71,149

Int. Cl. H02g 9/02, 15/04

U.S. Cl. 174—38 **51 Claims**



A protective cable splice assembly kit and method for use in making cable splice connections with provision for access, testing, inspecting and adding other splice connections at a later time. The assembly includes a tubular housing member adapted to seat about the legs of a loop formed in a main cable and to be clamped to a cup-shaped cap member telescoped over the return bend of the loop. One or more service cables can be assembled through the tubular housing and hermetically sealed to the latter along with the legs of the main cable by potting compound applied after grounding strips have been connected to the shielding sheaths of the main cable and of the service cables. Preferably the connections to all cable sheaths are hermetically sealed within potting compound. These strips include holes for attaching testing instruments as well as grounding wires to the electrical shields of branchout service cables. The flexible cap member flexes readily to compensate for pressure differential across the junction between the two housing members. The outer end of the service cables are hermetically sealed until needed to complete a service connection and are stored along with the splice enclosure in a subsurface casing having its normally closed top flush with ground level.

3,725,581

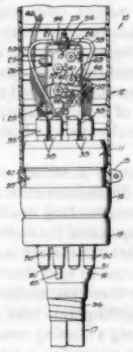
RE-ENTERABLE CABLE SPLICE ASSEMBLY AND METHOD INCLUDING PROVISION FOR ADDING BRANCHOUT SERVICE CABLES AS NEEDED

George W. Gillemot, 2331 20th St., Santa Monica, Calif., and John T. Thompson, 244 Loring St., Los Angeles, Calif.

Filed Aug. 2, 1971, Ser. No. 168,178

Int. Cl. H02g 9/02, 15/04

U.S. Cl. 174—38 **24 Claims**



A re-enterable cable splice enclosure or assembly and method for adding branchout service cable connections to a main cable as needed. The splice housing includes first and second separable parts one of which has a main cable sealed thereto along with a plurality of tubular passages adapted to receive additional service cables as needed with provision for maintaining the passage sealed by potting compound. The tubular passages are preferably chargeable with a non-setting permanent gel-like potting compound. The assembly includes provision for using shielded cables the shield jackets of which are seperably connectable to one another and having shield junctions submerged in potting compound.

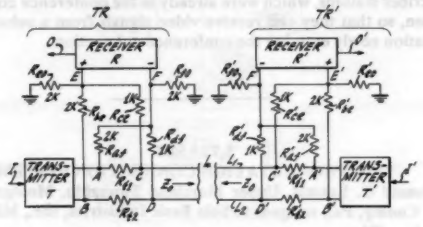
ERRATUM

For Class 178—6 see:
Patent No. 3,724,028

3,725,582
SIMULTANEOUS DIGITAL TRANSMISSION IN BOTH DIRECTIONS OVER ONE LINE

William John Davis, North Palm Beach, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 9, 1970, Ser. No. 96,492
Int. Cl. H04l 5/14
U.S. Cl. 178—58 3 Claims

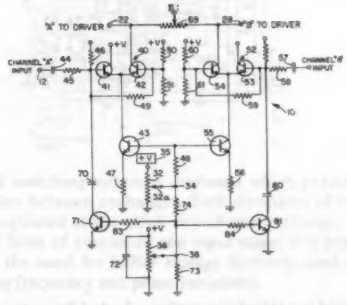


A duplex digital signalling system includes a transmission line having characteristic impedance terminations, a transmitter at each end of the transmission line for supplying digital signals through the characteristic impedance termination to the transmission line, and a differential receiver at each end of the transmission line. A resistor network couples each receiver across the local characteristic impedance termination, so that each receiver responds only to the distant transmitter, and digital information may be simultaneously transmitted in both directions through the transmission line.

3,725,583
VOLUME AND TONE CONTROL FOR MULTI-CHANNEL AUDIO SYSTEMS

Philip D. Gunderson, Prospect Heights, and Ronald J. Freimark, Addison, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed July 20, 1970, Ser. No. 56,301
Int. Cl. H03f 3/68
U.S. Cl. 179—1 VL 5 Claims

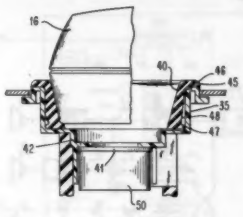


A single volume control for a plurality of audio channels is formed by a pair of gain controllable differential amplifiers operated as small-signal amplifiers in an open-ended configuration. The current source for each differential amplifier is provided by a variable current source, such as a transistor collector. By altering the DC bias on this variable current source transistor, the bias current and therefore the gain of the differential amplifier is correspondingly varied. A single potentiometer provides the DC voltage control for the variable current source transistors which, in turn, function as a volume control for the circuit.

3,725,584
ACOUSTIC COUPLER

Charlie C. Kilmer, and Robert J. Orchard, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,572
Int. Cl. H04m 1/00
U.S. Cl. 179—1 C 7 Claims

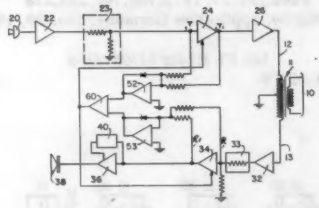


An acoustic coupler assembly for coupling a telephone handset to a terminal. The assembly contains a housing member of rubber having a plurality of soft foam washers which attach it to the base. The upper portion of the housing has an aperture which contains a tapered resilient sleeve having an inner diameter which corresponds to the outer dimension of a telephone handset. The sleeve is spaced from the wall of the housing so that it can accommodate the various shapes of handsets in use. A ridge at the base of the sleeve provides a limiting action and prevents the handset from being inserted too far.

3,725,585
LOUDSPEAKING TELEPHONE STATION CIRCUIT

John Moniak, and Edwin R. Bridenbaugh, both of Corinth, Miss., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed March 21, 1972, Ser. No. 236,714
Int. Cl. H04m 9/08
U.S. Cl. 179—1 HF 11 Claims

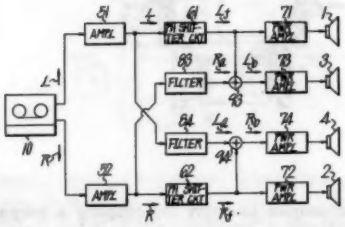


Disclosed is a circuit for providing voice controlled switching for a loudspeaking telephone station. The circuit is generally bistable and in one approach, it is possible for a small amount of bias to be inserted in the circuit to restore it to its transmit mode in the absence of external signals. In operation, a comparator continuously compares the transmit signals against received signal to determine in which mode the circuit should operate, i.e., continue in the operating mode or switch to the other mode. Once in a mode, either transmit or receive, an artificial signal gain is added to the main signal fed to the comparator to prevent oscillatory switching. The actual signal plus the artificial signal must be outweighed by the signal on the other path to effect a switchover.

3,725,586
MULTISOUND REPRODUCING APPARATUS FOR DERIVING FOUR SOUND SIGNALS FROM TWO SOUND SOURCES

Kazumi Iida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed April 11, 1972, Ser. No. 242,945
Claims priority, application Japan, April 13, 1971, 46/23300
Int. Cl. H04r 5/04
U.S. Cl. 179—1 G **8 Claims**

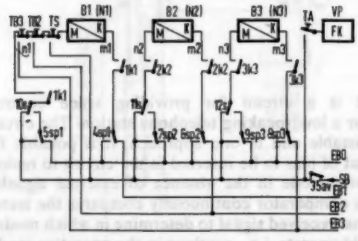


Left and right sound signals applied to two separate input circuits are each shifted in phase by a predetermined amount by phase shifters and are then supplied to separate output circuits. The left sound signal is also fed through a low pass filter to be combined with the phase shifted right sound signal and this combined signal is supplied to a separate output circuit. Likewise the right sound signal is fed through a low pass filter to be combined with the phase shifted left sound signal and this combined signal is also supplied to a separate output circuit. The resultant four outputs give the listener the illusion of naturalness.

3,725,587
APPARATUS FOR A TELEPHONE EXCHANGE SYSTEM WITH CONFERENCE EQUIPMENT AND HAVING A VIDEO CAPABILITY

Peter Klein, Feldafing, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 27, 1972, Ser. No. 221,238
Claims priority, application Germany, Jan. 29, 1971, P 21 04 338.9
Int. Cl. H04m 11/08, 3/56
U.S. Cl. 179—2 TV **4 Claims**

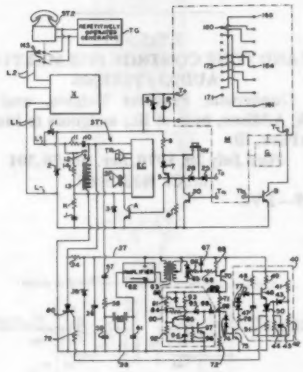


Apparatus is described for completing a conference connection in a telephone exchange system having a video capability. Each subscriber station has a video device constituted by a camera and a television receiver which may be connected to common video lines. Upon connection of a conference signal receiver and through a temporarily operated switch a new subscriber station's video device may be connected to the conference connection. This connection may be completed regardless of whether a conference connection already exists. Subsequently, switching means at each subscriber station, which connect the video devices therein to common video lines, are activated to switch the video devices in the subscriber stations, which were already in the conference connection, so that they can receive video signals from a subscriber station newly entering the conference connection.

3,725,588
TELEPHONE STATION CONNECTION SYSTEM

Donald C. Loomis, Upper Moreland Township, Montgomery County, Pa., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Aug. 9, 1971, Ser. No. 169,917
Int. Cl. H04m 11/04
U.S. Cl. 179—5 R **6 Claims**

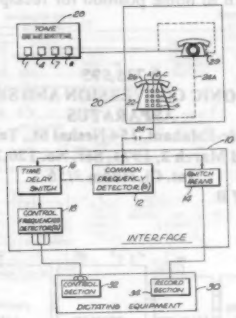


Disclosed is a telephone station adapted for communication through a telephone line and an exchange with a second station at which there will be repetitively superimposed on the communication a signal of predetermined frequency. At the first station there is provided automatic dialing apparatus available for operation to dial the second station, as an incident to which operation the first station will be connected across the line and there will be started an initial operation of a timer. A superseding operation of the timer will be started an an incident to the first station receiving a signal of the predetermined frequency, whereas in response to an unsuperseded operation of the timer the conductive connection abovementioned will be terminated.

3,725,589
REMOTE-CONTROL SYSTEM FOR INTELLIGENCE-RECORDING APPARATUS WITH CONTROL TONE ELIMINATING SWITCHING

Michael E. Golden, 1700 Midvale Avenue, Los Angeles, Calif.

Filed Feb. 14, 1972, Ser. No. 225,828
Int. Cl. H04m *11/10*; G11b *19/2*
U.S. Cl. 179—6 E 12 Claims

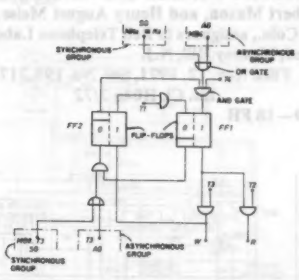


An interface between a telephone system and dictating equipment whereby control signals and intelligence are transmitted over the telephone system and to the dictating equipment to appropriately record the intelligence while eliminating any recordation of the control signals.

3,725,590
ARRANGEMENT FOR TDM TELECOMMUNICATION BETWEEN PCM SWITCHING NETWORKS

Willi Verstegen, Kornwestheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 1, 1971, Ser. No. 176,834
Int. Cl. H04j
U.S. Cl. 179—15 BS 6 Claims



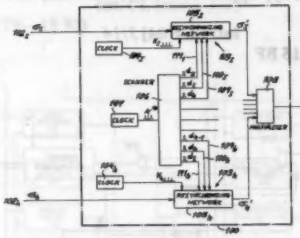
A TDM switching system is disclosed which permits PCM transmission between exchanges. Both directions of transmission are regulated at the clock rate of one exchange. Using a particular form of control of one input stage, it is possible to eliminate the need for buffer storage formerly used to compensate for frequency and phase variations.

3,725,591
SYNCHRONIZATION NETWORK FOR PCM MULTIPLEXING SYSTEMS

Maurizio Palombari, and Luciano Di Biago, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Feb. 7, 1972, Ser. No. 224,197
Claims priority, application Italy, Feb. 9, 1971, 20346 A/71
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 AF 10 Claims

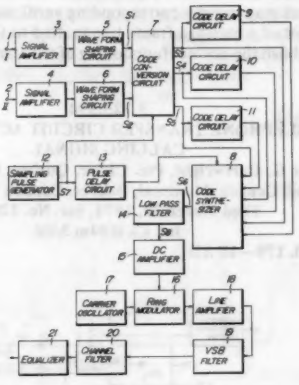
At a multiplexing station serving for the bit-by-bit interleaving of binary pulse trains received from a plurality of feeder channels for retransmission over a common signal path, the bits of each incoming train are stored in a multistage register for a period approximately equaling the length of a scanning cycle during which the several memories are successively sampled, in repeated subcycles, by reading pulses recurring at a rate substantially higher than the bit rate of the individual trains. The storage period of a particular register , measured by a first counter which is stepped by a series of clock pulses recurring at the bit rate, and the corresponding scanning cycle, measured by a second counter in response to the recurrent reading pulses addressed to that register, are compared once every two scanning cycles by a pair of monitoring pulses flanking a reading pulse; if either monitoring pulse coincides with a timing pulse generated during alternate storage periods of one register stage, the allocation of the reading pulses to the several stages of the register is shifted by feeding into the second counter a corrective pulse advancing the count thereof by the equivalent of half a scanning cycle.



3,725,592
AMPLITUDE QUANTIZED SIGNAL TRANSMISSION METHOD

Yutaka Tanaka, Tokyo, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Continuation of Ser. No. 736,418, June 12, 1968, abandoned.
This application Dec. 13, 1971, Ser. No. 207,442
Claims priority, application Japan, June 13, 1967, 42/38404; April 30, 1968, 43/29396
Int. Cl. H04b *13/00*
U.S. Cl. 179—15.55 R 9 Claims



A signal transmission method which reduces the frequency band of a transmission channel by sampling the input signal, quantizing each sampled pulse, combining the quantized pulses into a group of pulses, combining the quantized pulses in each group into a single pulse the quantized amplitude of which is uniquely determined from the quantized amplitude of each component pulse. The signal transmission method is used for transmitting video, facsimile, audio, data or other similar

signals characterized by a high density of information with sufficient recognizability at a comparatively slight cost of signal-noise ratio.

3,725,593

PCM TELECOMMUNICATION SYSTEM WITH STANDBY CLOCK

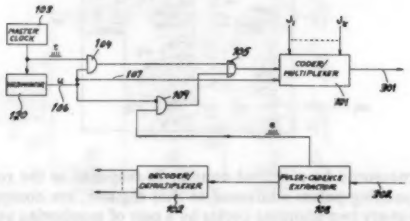
Maurizio Palombari, Milan, Italy, assignor to Societe Italiana Telecommunicaziani Siemens, S.p.A., Milano, Italy

Filed Feb. 22, 1972, Ser. No. 228,000

Claims priority, application Italy, Feb. 22, 1971, 20861 A/71

Int. Cl. H04j 3/14

U.S. Cl. 179—15 BF **7 Claims**



At a main terminal connected to a remote terminal by way of a PCM signal path, a master clock controls the multiplexing of incoming messages from local lines for transmission over an outgoing line of that path to the remote terminal in a bipolar code enabling extraction of the clock frequency at the remote terminal. A discriminator at the main terminal continuously checks the operation of the master clock and, if that operation is normal, causes the transmission of a verification bit over the outgoing line to the remote terminal in an assigned time slot of a service channel of a period message frame; at the remote terminal, a detector responds to either the absence of the verification bit or the nonarrival of message signals to activate a standby clock controlling the sending of composite messages to the main terminal over an incoming line of the signal path. An extractor at the main terminal, connected to that incoming line, delivers the reconstituted pulses of the standby clock to the multiplexer in lieu of the output of the master clock if the latter operates improperly or not at all, as determined by the associated discriminator; a similar discriminator at the remote terminal may insert a corresponding verification bit into a service slot of a message frame transmitted to the main terminal to establish the correct functioning of the standby clock.

3,725,594

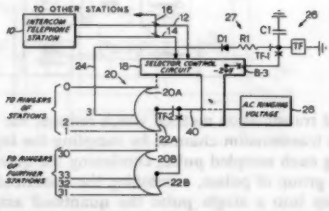
TELEPHONE TRANSFER CIRCUIT ACTUATED BY CALLING SIGNAL

Delmar G. Cartwright, Pte. Claire, Quebec, Canada, assignor to Bell Canada, Montreal, Quebec, Canada

Filed March 29, 1971, Ser. No. 128,690

Int. Cl. H04m 3/04

U.S. Cl. 179—18 AD **6 Claims**



In an intercom telephone system, when a digit is dialled, a selector control circuit causes a selector to step to a position corresponding to the digit dialled, and ringing is then applied through the selector contacts to the called station. When more than ten stations are needed, one selector contact is connected through a rectifying circuit to a transfer relay. When the digit for such contact is dialled, the ringing voltage applied through such contact is rectified and operates the transfer relay. The transfer relay locks operated, shifts the ringing to the input of another selector level the contacts of which are connected to stations having two digit codes, and causes the selector to return to home position for receipt of the second digit.

3,725,595

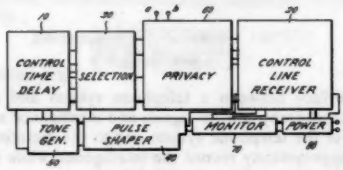
ELECTRONIC CONVERSION AND SECRECY APPARATUS

Bahram Mechanic-Esfahani, 154 Neshat St., Teheran, Iran

Filed March 2, 1971, Ser. No. 120,224

Int. Cl. H04m 3/56

U.S. Cl. 179—17 B **11 Claims**



An apparatus is disclosed which is inserted into a telephone party line to convert such party line into a private line in response to a telephone call involving a party in the party line and provide secrecy to such call and prevent interference and eavesdropping with a completed call by other parties in the party line.

3,725,596

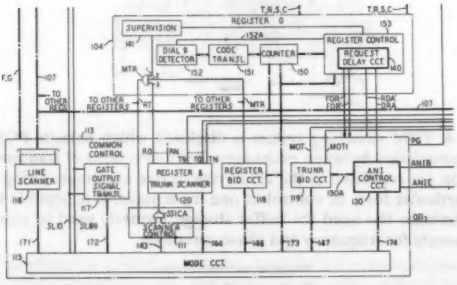
PBX AUTOMATIC NUMBER IDENTIFICATION SYSTEM

Rodney Robert Maxon, and Henry August Meise, Jr., both of Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 12, 1971, Ser. No. 198,217

Int. Cl. H04q 3/72

U.S. Cl. 179—18 FH **18 Claims**

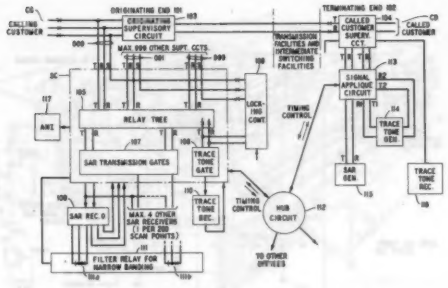


A PBX is disclosed having equipment for automatically generating and transmitting calling station and trunk number information to a central office on outgoing calls. The disclosed system is an improvement in the art in that it does not require additional equipment, such as matrices, for generating the number information. Instead, it obtains this information from pre-existing system circuitry which generates the same information in order to control the establishment of the network paths required for the serving of these calls.

3,725,597
CALLING LINE IDENTIFICATION SYSTEM

Kenneth Streisand, East Brunswick, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 1, 1971, Ser. No. 158,784
Int. Cl. H04q 3/72
U.S. Cl. 179—18 FH **8 Claims**

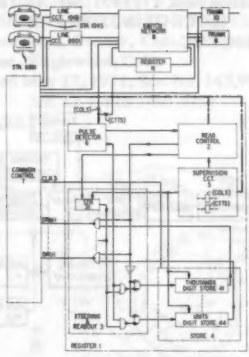


In a telephone calling line identification system a substantial increase in call tracing capacity is achieved by a timing arrangement in a simulated audible ring tone receiver that controls a scanner to the end that each line, rather than being held for a fixed period, is held only so long as a valid signal appears to be present, the line being released in response to the earliest indication that there is no valid signal.

3,725,598
DIGITAL REGISTER READOUT CIRCUIT

Edwin Julius Braun; Henry August Meise, Jr., and George William Taylor, all of Boulder, Colo., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed July 16, 1971, Ser. No. 163,213
Int. Cl. H04q 3/42
U.S. Cl. 179—18 EB **11 Claims**

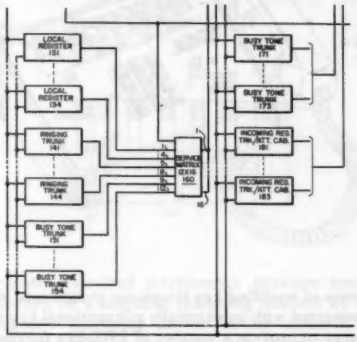


A register readout circuit arranged for use with common control switching systems wherein number digits are stored and serially read out at a high speed into a common controller. The circuitry utilizes binary ripple counters having a predetermined number of counting states to register each number digit. During the readout sequence, the common controller applies a high speed pulse train having a number of pulses equal to the number of counting states to each counter. When the counters are advanced to their initial zero counting states associated logic circuitry is enabled to gate remaining pulses of the high speed pulse train over digital leads to the common controller. Since the remaining pulses are mathematically equal to the registered number digits of the counters their reception by the common controller effectively constitutes a nondestructive readout of the registered number digit.

3,725,599
CALL PICKUP SERVICE FOR PABX TELEPHONE SYSTEM

Elmer W. Krock, Chicago, and Charles J. Simon, Hinsdale, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 22, 1971, Ser. No. 165,260
Int. Cl. H04m 3/42
U.S. Cl. 179—18 BD **7 Claims**

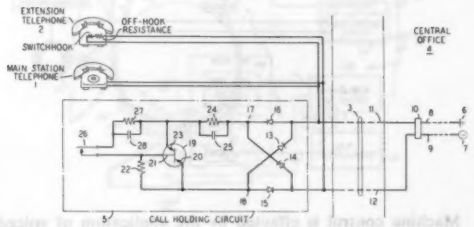


In a private automatic branch telephone system of the common control type, facilities are included whereby a predetermined group of subscribers may answer calls originated either within the private branch telephone system or in an associated central office and destined for termination at a particular substation in the group, at any other substation within the predetermined group. Under control of a central processor the answering station is detected as well as the originally called station and the originating calling circuit, after which the originating calling circuit is connected to the answering station and the original called station is released.

3,725,600
COMMUNICATION CALL HOLDING CIRCUIT

Gerald E. Hutton, Springfield, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Dec. 18, 1969, Ser. No. 886,068
Int. Cl. H04m 1/00
U.S. Cl. 179—99 **23 Claims**



An electronic telephone call holding circuit including PNPN transistor and pushbutton arrangements is disclosed for enabling a customer conducting a call on one phone to place a "hold" condition on that call, to disconnect that phone from the call by placing the handset "on-hook", and then to answer the call at an extension phone by moving its handset "off-hook", which "off-hook" automatically effects a removal of the "hold" condition without manual key operations.

3,725,601
DIRECT STATION SELECTION PRIVATE INTERCOM EXCHANGE SYSTEM

John J. Jetzt, Lincroft, and John Charles Sullivan, Shrewsbury, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

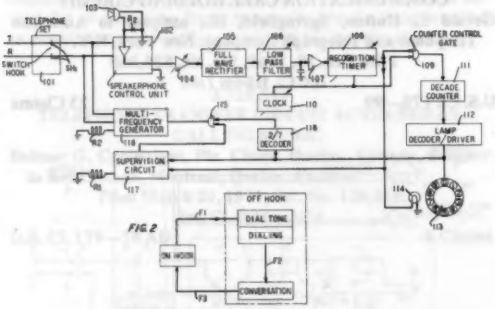
Filed March 5, 1971, Ser. No. 121,398
Int. Cl. H04m 1/70
U.S. Cl. 179—99 10 Claims

A group of modified key telephone station sets is uniquely interconnected with substantially conventional key telephone equipment to provide a number of PBX-like functions. Each station set is provided with a privacy circuit which under all conditions prevents a station from gaining access to any line already in use.

3,725,602
MACHINE CONTROL BY ACOUSTIC ENERGY

Clifford James Hoffman, Oceanport, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1970, Ser. No. 101,817
Int. Cl. H04m 1/26
U.S. Cl. 179—90 R 9 Claims

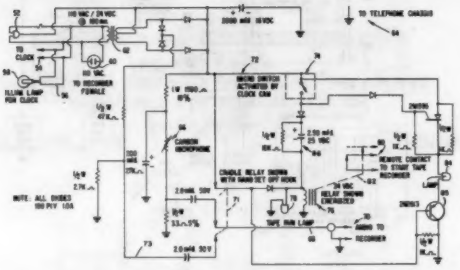


Machine control is effected by the application of voiced commands or other acoustic energy to a transducer to coincide in time with one of a plurality of indicia being displayed sequentially by a clock-driven indicator. The encoded electrical output achieved thereby is utilized to actuate machine control switching apparatus such as a telephone dial and switchhook. Initiating forces other than acoustic, for example the manual closing of a single switch encoded in terms of time and duration of operation, may alternatively be employed in combination with the clock-driven indicator.

3,725,603
AUDIO VISUAL PROGRAM RATING SYSTEM

Harold F. Mathews, 523 Cashmere Terrace, Los Angeles, Calif.; Jack M. Reeder, 3626 Hampstead Street, Pasadena, Calif., and James A. Ingram, 1197 Arden Road, Pasadena, Calif.

Filed July 21, 1971, Ser. No. 164,553
Int. Cl. G11b 15/18, 27/28, 31/00
U.S. Cl. 179—100.1 R 8 Claims

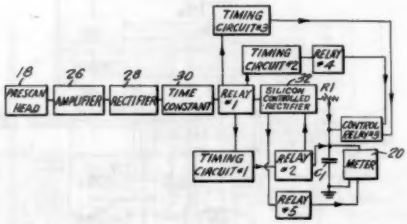


A system and apparatus for rating users actual viewing or listening habits for radio and television, using voice recorders. The system uses voice recorders and information is periodically recorded and transmitted to recorders which are usable in a manner which determines actual viewing or listening habits of the ultimate users with a superior degree of accuracy with each television or radio set in an area of rating sample being equipped with its own instrument which records viewing and demographics while the program is actually being viewed.

3,725,604
SIGNAL DETECTING APPARATUS FOR USE IN SOUND TRACK RERECORDING

Ronald Crawford Alexander, 4063 Northcliffe Avenue, Toronto, Ontario, Canada

Continuation of Ser. No. 820,397, April 30, 1969. This application Sept. 17, 1971, Ser. No. 181,470
Int. Cl. G11b 27/22, 27/36
U.S. Cl. 179—100.1 VC 6 Claims



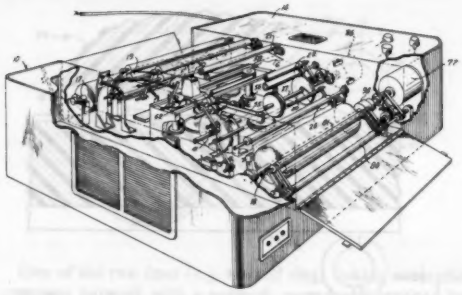
A signal detecting apparatus for use in sound track rerecording comprising a magnetic storage tape having voice frequency signals transcribed thereon. A first magnetic pickup head is adapted to sense the presence or absence of the voice frequency signals on the magnetic tape. A synchronizing circuit is connected to said first pickup head and to a visual indicator. A second magnetic pickup head is associated with the magnetic tape. The synchronizing circuit is operable by the presence of voice frequency signals at the first magnetic pickup head for producing signals indicative of the exact beginnings and ends of the voice frequency signals and any pauses the voice frequency signals being sensed by the second magnetic pickup head.

3,725,605

WIDE WEB RECORDER WITH INCREMENTAL TAPE TRANSPORT AND MULTIPLE TRANSVERSALLY SCANNING HEADS

Marcel M. E. Michelin, Apartado No. 5, Alhaurin el Grande, Malaga, Spain

Filed Aug. 7, 1970, Ser. No. 62,085
Int. Cl. G11b 5/48, 21/04
U.S. Cl. 179—100.2 T 16 Claims



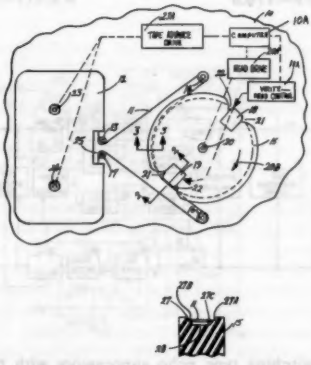
Apparatus for recording or playing back information magnetically recorded on a tape or web having a recording width of five inches or more for the purpose of handling recordings of long duration, such as books. The apparatus includes means for intermittent incremental advance of the web from the feed spool to the take-up spool, and means for producing traversal of the record-playback heads transversely across the web relative to adjacent, parallel, transverse tracks on the web. In one form, a head reciprocates back and forth to produce one or more tracks between each incremental web advance. In another form, heads carried on a rotor produce two or more adjacent tracks in the same direction between each incremental advance of the web. The apparatus includes means for rapid advance and rewind of the web.

3,725,606

ROTATING MAGNETIC TAPE HEAD HAVING AIR CUSHION SUPPORT FOR THE TAPE

Kenneth C. Thompson, Denver, Colo., assignor to Electronic Processors, Inc., Englewood, Colo.

Filed May 17, 1971, Ser. No. 143,958
Int. Cl. G11b 5/60, 5/52
U.S. Cl. 179—100.2 P 5 Claims



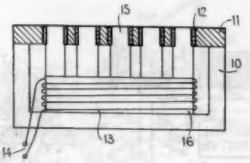
A rotating head structure used in magnetic tape recorders such as those for storing digital data. The head assembly has a tape guiding groove and one or more recording and/or playback heads and is rotated so as to move the heads relative to the tape. The tape guiding groove is generally V-shaped in cross section and is narrower than the tape width along the inner portions of the grooves. As the head rotates air is carried along in the groove and the tape tends to float on an air cushion.

3,725,607

MAGNETIC RECORDING APPARATUS WITH EDGE ERASE MEMBERS WHICH ERASE AREA BETWEEN TRACKS

Edward Barnabas Angold, Chichester, England, assignor to International Computers Limited, London, England

Filed April 23, 1971, Ser. No. 136,932
Claims priority, application Great Britain, May 26, 1970, 25,231/70
Int. Cl. G11b 5/02, 5/22
U.S. Cl. 179—100.2 D 9 Claims



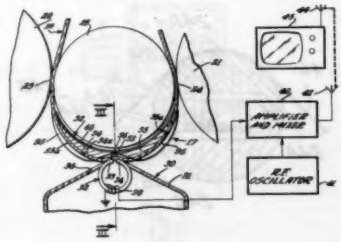
To eliminate undesired interference between tracks of signals recorded on a magnetic recording medium by a multitrack magnetic recording device having adjacent heads spaced apart by predetermined distances, the marginal edge portions of the signal tracks are erased by erase heads. These are located in fixed positions relative to the record heads so that after recording, the signal tracks travel past the erase heads to remove said marginal portions. To ensure that the erasing effect is limited to the marginal edge portions each erase head is surrounded, except for the actual erasing area, by a non-magnetic medium.

3,725,608

MAGNETIC TRANSDUCER SYSTEM WITH HEAD ENGAGING SLIDABLY SUPPORTED TAPE SOAP ADJACENT THE CAPSTAN

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 44,510, June 8, 1970. This application Aug. 4, 1970, Ser. No. 60,806
Int. Cl. G11b 5/54, 15/32
U.S. Cl. 179—100.2 C 4 Claims



A magnetic tape apparatus wherein a capstan drive assembly provides a tape path thereabout and receives a transducer head with a convex face for scanning engagement with the tape. A magnetic shield may be interposed between the capstan and the head where the capstan is of magnetizable steel. The motor, flywheel and capstan form a unitary assembly which preferably includes a bearing for the outer end of the capstan. A endless loop or reel-to-reel tape cartridge

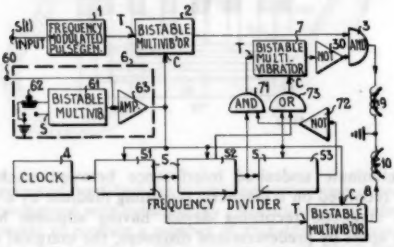
configuration may be engaged with the capstan assembly without manual threading. Idler rollers for the capstan are of configuration to tension the tape at the transducer head location, and may be interchanged to tension the tape in either direction of movement. A preferred head is operable with bias of 10 megahertz or more.

3,725,609

SYSTEM FOR MAGNETIC RECORDING AND REPRODUCING OF A SIGNAL BY MEANS OF A FREQUENCY-MODULATED RECTANGULAR WAVE

Pierre Lebourg, Paris, France, assignor to Thomson-CSF, Paris, France

Filed April 7, 1971, Ser. No. 131,857
Claims priority, application France, April 28, 1970, 7015526
Int. Cl. G11b 5/44, 5/06
U.S. Cl. 179—100.2 K 5 Claims



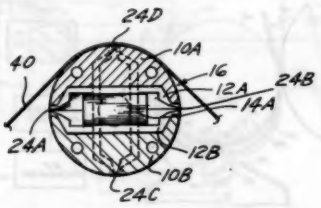
A magnetic tape recording and playback system wherein, to avoid errors in the reproduced signal caused by the wow of both the recording and playback apparatus, the electrical signal to be recorded frequency modulates a pulse train and is recorded on magnetic tape together with a constant frequency pulse signal, both recorded signals are demodulated and fed to an analogue divider circuit delivering a signal proportional to the ratio between the frequencies of frequency modulated and the constant frequency pulses.

3,725,610

ROTATABLE MAGNETIC TRANSDUCER HEAD

Kenneth R. Wisner, 263-A West 12th St., New York, N.Y.

Filed Jan. 27, 1971, Ser. No. 110,075
Int. Cl. G11b 5/10, 5/28, 5/52
U.S. Cl. 179—100.2 C 3 Claims



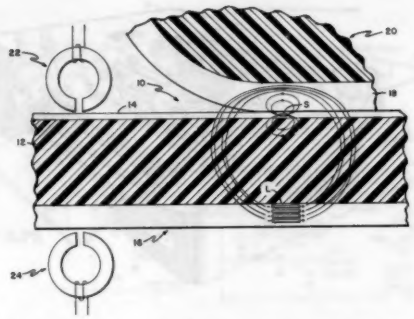
Supported within a cylindrical housing are first and second magnetic pole members which are displaced from each other along the axis of the housing. Each pole member has at least one transducing gap. The gaps are opposite rotationally displaced openings in the housing. The transducer head is rotatable about the axis of the cylindrical housing. There is disclosed a two-gap and a four-gap embodiment of the transducer head.

3,725,611

DOUBLE COATED STORAGE MEDIUM FOR CONTACT TRANSFER RECORDING

Philip Smaller, 4155 Wilkie, Palo Alto, Calif.

Filed Sept. 30, 1971, Ser. No. 185,136
Int. Cl. G11b 5/70, 5/86
U.S. Cl. 179—100.2 A 4 Claims



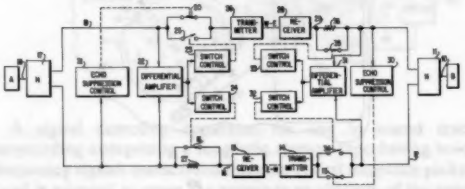
A double coated magnetic tape has a relatively thin ferromagnetic layer for storing short wavelength signals and a thicker ferromagnetic layer spaced from the first layer by an intermediate nonmagnetic base for storing long wavelength signals. The thickness of the base and the ferromagnetic layers are selected so that short wavelength signals are efficiently transferred by the thin layer and long wavelength signals are efficiently transferred by the thick layer, the intermediate wavelength harmonics of the long wavelength signals being attenuated by the spacing of the thick layer from a copy tape adjacent the thin layer to which the information is to be transferred.

3,725,612

ECHO SUPPRESSOR BREAK-IN CIRCUIT

Samuel Joseph Campanella, Gaithersburg; Henri George Suyderhoud, Potomac, and Michael Onufry, Jr., Gaithersburg, all of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed May 14, 1971, Ser. No. 143,370
Int. Cl. H04b 3/20
U.S. Cl. 179—170.6 5 Claims

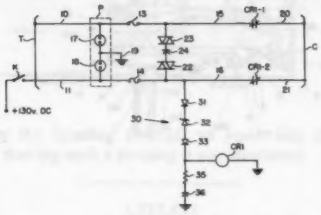


Split, switching type echo suppressors with break-in circuitry having dual control of the two break-in switches. At break-in each break-in switch is independently and simultaneously operated for the break-in state. After cessation of break-in each break-in switch is maintained for different hangover periods before reverting to the non-break-in state.

3,725,613
APPARATUS FOR PROTECTING AND TESTING TELEPHONE NETWORK

Richard W. Allen, Rairport; Donald G. Maring, Sr., and Henry J. Andrews, Jr., both of Rochester, all of N.Y., assignors to The Rochester Telephone Corporation, Rochester, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,632
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 **4 Claims**

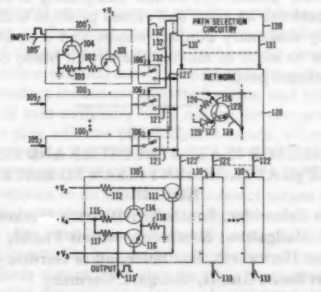


One of the two lines (e.g. tip and ring) linking a telephone company network with a network owned and serviced by a customer of the telephone company is connected through a Zener diode with a relay, which controls two normally-closed switches disposed in the two linking lines. During normal operations the signals in the associated linking line are not great enough to trigger the diode, which maintains the relay deenergized. If a fault develops in one of the networks, an operator at a remote central station of the phone company momentarily applies a high voltage through the associated linking line to the diode, which conducts and momentarily energizes the relay to open its switches and isolate the networks from one another. An RC circuit in parallel with the relay holds it energized for a short time after the triggering signal disappears to enable the operator to test the phone network for faults. Also the two linking lines are provided with current, voltage and power overload devices to prevent customer-owned equipment from damaging the company's network.

3,725,614
COMMUNICATION ARRANGEMENT ALLOWING NETWORK PATH TESTING

Matthew Francis Slana, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed April 13, 1971, Ser. No. 133,666
Int. Cl. H04m *3/08*
U.S. Cl. 179—175.2 R **10 Claims**

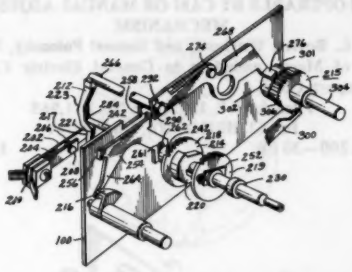


Terminating circuits for a switching network provide cross-point bias current, pulse transfer, and path testing. Pulse transfer occurs by allowing the bias current to represent one binary value and increasing the current to a second level for the other binary value. When the second level is N times the bias level, $1<N<3$, and the detection circuitry only responds to currents above a threshold level of X times the bias current, where $N+1/2 \leq X<N$ for $1<N \leq 2$, and $N+1/2 \leq N<2$ for $2<N<3$, discontinuities, grounds, and crosses to other paths can be detected by sequentially applying two complementary binary test input signals to an input circuit and observing the responses thereto at the connected output circuit.

3,725,615
PAWL AND RATCHET MECHANISM FOR ALARM CLOCK TIMER SLEEP SWITCH CAM

Robert L. Boyles, Wayland, and Samuel Polonsky, Medway, both of Mass., assignors to General Electric Company, Bridgeport, Conn.

Filed April 7, 1972, Ser. No. 242,032
Int. Cl. H01h *43/00, 7/08*
U.S. Cl. 200—38 FB **9 Claims**

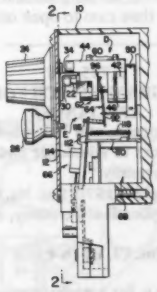


A sleep switch movement for a clock timer wherein a unique pawl and ratchet mechanism is provided for driving a sleep switch cam. A pawl is counterweighted for urging it into contact with teeth on the sleep cam. The pawl is indexed one increment each minute by a drive mechanism; however, a cam shaft having two flat surfaces is positioned in engagement with the pawl for permitting the pawl to drive teeth on the sleep cam only twice for each revolution of the cam or once every five minutes.

3,725,616
RELAY CLUTCH TIMER WITH ADJUSTABLE CAM MEMBER

Frank Arthur Pearson, Moline, Ill., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed July 22, 1971, Ser. No. 165,142
Int. Cl. H01h *43/10*
U.S. Cl. 200—38 R **9 Claims**



An adjustable reset timer for providing delayed time sequences for electrical circuits. In the timer, an adjustable cam member, including a cam hub having a serrated face is disposed about the drive shaft of a synchronous motor in a free wheeling relationship therewith. A clutch hub member, also having a serrated face, is received over the drive shaft in rotational driving engagement therewith and is axially shifta-

ble along the drive shaft between engaging and non-engaging positions relative to the cam hub. In the engaging position, the serrations on the hubs mate to form a rotational driving connection therebetween so that in that position, the cam member is rotatably driving from a non-energizing to an energizing position relative to at least one load switch. The clutch hub is normally biased toward the engaging position but is prevented from engagement with the cam hub by a retaining lever. The lever is disposed in an operative relationship with an electrical relay which is selectively energizable and de-energizable to permit the lever to be moved between retaining and non-retaining conditions with resultant corresponding movement of the clutch hub between the non-engaging and engaging positions.

3,725,617

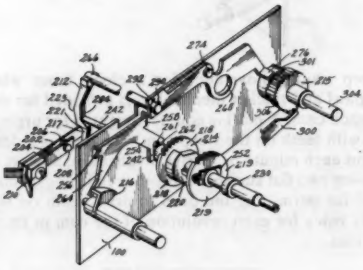
ALARM CLOCK TIMER WITH SWITCH ACTUATING LEVER OPERABLE BY CAM OR MANUAL ADJUSTMENT MECHANISM

Robert L. Boyles, Wayland, and Samuel Polonsky, Medway, both of Mass., assignors to General Electric Company, Bridgeport, Conn.

Filed April 7, 1972, Ser. No. 241,965

Int. Cl. H01h *43/18*; G04c *23/44*

U.S. Cl. 200—38 FB **14 Claims**



A switch actuating and control mechanism for an alarm clock timer wherein a uniquely shaped switch actuating lever is positioned between an alarm time cam and a switch blade. The alarm time cam moves the switch actuating lever in a lateral direction to close the switch at the alarm time. A manually operable lever is pivotally connected to one end of the switch actuating lever for longitudinally sliding the actuating lever on the alarm time cam to open or close the switch.

3,725,618

ELECTRIC PROGRAM SWITCH FOR AUTOMATIC APPLIANCES

Dieter Voland, St. Georgen, and Erich Scheer, Peterzell, both of Germany, assignors to Kieninger and Obergfell, Georgen im Schwarzwald, Germany

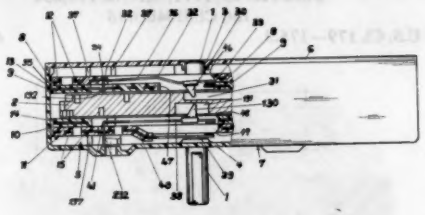
Filed Aug. 27, 1970, Ser. No. 67,377

Claims priority, application Germany, Sept. 3, 1969, P 19 44 648.1

Int. Cl. H01h *43/08*

U.S. Cl. 200—46 **10 Claims**

A program switch, e.g. for a washing machine, has a rotating platter with cam tracks on both sides sandwiched between two pairs of contact carriers. Each contact carrier is a flat body of insulating material with a multiplicity of contact strips imbedded therein, these strips being originally part of a continuous metal foil coated on both sides with insulation. The contact strips of one plate of each pair terminate in a set of projecting tabs while those of the companion plate may remain interconnected and are tied to a supply conductor. The free ends of one set of contact strips of each pair project into cutouts of the respective plates and carry projections in engagement with the associated cam tracks for movement relative to the exposed tips of co-operating strips of the other set.



3,725,619

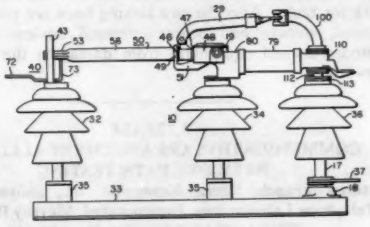
ELECTRIC DISCONNECT SWITCH HAVING IMPROVED COUNTER BALANCE MECHANISM

John P. McKinnon, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 20, 1972, Ser. No. 246,006

Int. Cl. H01h *31/00*

U.S. Cl. 200—48 A **4 Claims**



An electric disconnect switch comprising a switch blade movable between an open and closed position with respect to a relatively stationary contact means and a counterbalance mechanism to assist in moving the switch blade between the open and closed position.

3,725,620

DISTRIBUTOR PLATE STRUCTURE AND FIXEDLY MOUNTING ATTACHMENT MEAN TO DISTRIBUTOR HOUSING

Karl-Heinz Schneider, Sonthofen; Dietrich Herker, Giengen; Herbert Madgefrau, Sonthofen; Alfons Plockl, Bihlerdorf, and Ernst Horrwarth, Sonthofen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 4, 1971, Ser. No. 195,751

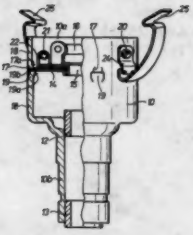
Claims priority, application Germany, Nov. 7, 1970, P 20 54 930.8

Int. Cl. H01h *9/02*

U.S. Cl. 200—19 R **7 Claims**

The outside of a circumferential wall of a distributor housing is formed at circumferentially spaced locations with

depressions thereby creating at the inner side projections which center and retain a breaker assembly support plate in-



serted into the housing through an open side thereof. A method of making such a housing is also disclosed.

3,725,621

MULTI-CONTACT DATA MODULE HAVING A CONNECTION MATRIX AND A SWITCHING BODY AND ACTUATOR PLUG TEMPLATE

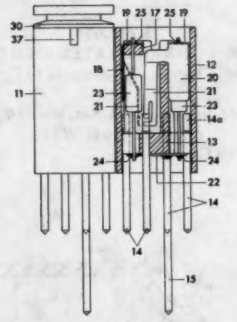
Josef Kirchdorf, Gerlafingen, Switzerland, assignor to Ghielmetti AG, Solothurn, Switzerland

Division of Ser. No. 872,901, Oct. 31, 1969. This application Sept. 22, 1971, Ser. No. 182,661

Claims priority, application Switzerland, Nov. 7, 1968, 16633/68

Int. Cl. H01h *27/10*

U.S. Cl. 200—46 **9 Claims**



A multi-contact data module for a connection matrix having an input channel and a plurality of output channels, said data module comprising at least one switching body means defining a hollow internal cavity, contact pins for establishing electrical connections to the input channel and the plurality of output channels of the connection matrix, said contact pins extending into said hollow internal cavity of said switching body means. Movable contact means are disposed within said hollow internal cavity of said switching body means for cooperation with the contact pins, said movable contact means, when actuated, effecting electrical connections with said contact pins. A single actuator means is provided for each switching body means which is common to all the movable contact means thereof intended to be actuated, such single actuator means comprising a separate plug member means totally separatable from, but removably insertable into, said hollow internal cavity of said switching body means, said plug member means including actuating means for selective ones of said movable contact means. This separate, removably insertable plug member means, when inserted into said hollow internal cavity of said switching body means, serving to deflect selective ones of said contact means against the associated contact pins, whereby a given data distribution mode is effected. There is also provided programing template means having a respective cut-out for each plug member means substantially conforming to the cross-sectional shape of said actuating means on each of said plug members means, whereby said programing template means provides storage of a plurality of data distribution modes.

3,725,622

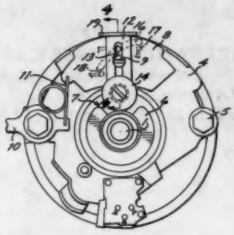
SEMI AUTOMATIC VEHICLE SIGNAL CONTROL DEVICE

Ralph J. O'Keefe, 161 East Orangethorpe Ave., Space 12, Placentia, Calif.

Filed Nov. 1, 1971, Ser. No. 194,322

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.27 **5 Claims**



When a vehicle turns to either the right or left, a signal light must be lit indicating such a turn. This invention provides a means whereby the signal light (either right or left) is turned on by the movement of the steering wheel. Movement of the steering wheel will automatically close a switch and turn on a signal light indicating to another vehicle that the one vehicle is about to execute a turn.

3,725,623

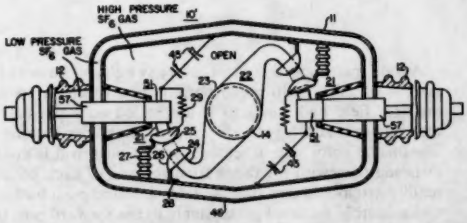
GAS-BLAST DOWNSTREAM-TYPE OF HIGH-VOLTAGE CIRCUIT BREAKER HAVING FIELD-CONTROLLING SHIELDS AND SINGLE VENTING MOVABLE CONTACT

William H. Fischer, Pittsburgh, and Charles F. Cromer, Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 28, 1968, Ser. No. 771,113

Int. Cl. H01h *33/54*

U.S. Cl. 200—148 B **16 Claims**



In a circuit breaker of the live tank type SF_6 or other gas, is contained in the tank of high-pressure. Two hollow series-con-

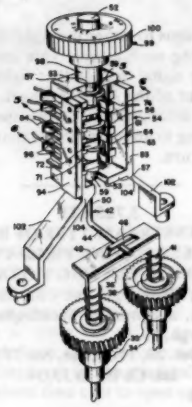
nected movable contacts bridge stationary contacts inside the tank. A double break is provided and two stationary shields are provided per break—to give a substantially uniform voltage gradient across the contacts in the open position. Capacitors are used to divide the voltage across the open contacts. A probe arrangement is used to insert resistors into the circuit to reduce the rate of rise of recovery voltage. The shields are contoured to establish a high velocity flow of gas into the arc region. Flow of gas from the high pressure tank through the hollow contacts into a low pressure chamber is controlled by a down stream blast value. Double flow of the gas can be obtained by providing secondary downstream valves and hollow contacts in each bushing in addition to the main downstream valve.

3,725,624

ROTARY SWITCH BEATER EJECTOR

Robert J. Emmons, Collinsville, Conn., assignor to Dynamics Corporation of America, New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,654
Int. Cl. H01h *21/10, 3/42*
U.S. Cl. 200—157 **13 Claims**



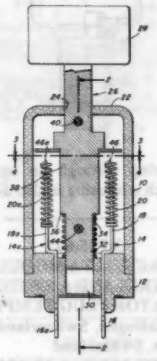
A food mixer speed control rotary switch and beater ejector unit in which a multi-speed permutation rotor for switching multiple field coil windings is journalled on a plastic frame that supports axially spaced spring switch blades bearing radially on the rotor and a beater ejection push rod is coaxially disposed therewith for the mutual support of each other in a readily assembled unit that includes a nested push button and dial assembly recessed protectively in the forward post of the food mixer handle. The shaft of the dial is journalled in the handle and supports the upper ends of the rotor and ejector rod for thumb operation selectively and simultaneously. Some of said spring switch blades are in open, stressed engagement with said rotor at any given time to hold the rotor in said journalling means.

3,725,625

MECHANICAL PUSHBUTTON SWITCH WITH POINTED END COIL SPRING CONTACT

Albert R. Pratt, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 25, 1971, Ser. No. 174,596
Int. Cl. H01h *13/52, 1/06*
U.S. Cl. 200—159 R **3 Claims**



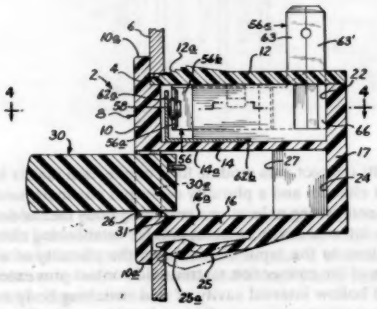
A switch, particularly useful as a keyboard switch, which comprises a casing containing two or more free-standing coil contacts and a longitudinally movable switch bar carrying a shorting plate which when depressed engages adjacent ends of the coil contacts to close an electrical circuit therebetween.

3,725,626

WATERPROOF DOOR-OPERATED SWITCH ASSEMBLY

Marvin A. Kruse, Chicago, Ill., assignor to Littlefuse, Inc., Des Plains, Ill.

Filed Jan. 21, 1972, Ser. No. 219,702
Int. Cl. H01h *9/04*
U.S. Cl. 200—168 G **14 Claims**



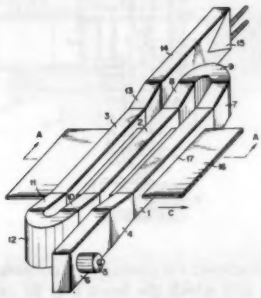
A switch assembly comprising a housing having juxtaposed sections respectively defining a switch compartment and an actuator member-receiving space separated by a wall forming a water-tight barrier against the entry of water splashing thereagainst. The actuator member-receiving space opens onto the front exterior of the housing through a first aperture facing in a direction parallel to said water barrier-forming wall. An actuator member in the actuator member-receiving space has a pivot shaft extending in water-sealing relation through an aperture in said wall into said switch compartment. The actuator member is resiliently urged to a position where it projects from the first aperture and is retracted within said space by the pressure of a door closing thereagainst. The actuator member shaft operates switch means in the switch compartment of the housing when the actuator member is

retracted within said space. The actuator member-receiving space also opens preferably onto the exterior of the housing through another aperture facing in a direction parallel to the water barrier-forming wall and at right angles to said first aperture.

3,725,627
MICROWAVE HEATER

Sakai Arai, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 24, 1971, Ser. No. 156,434
Claims priority, application Japan, June 26, 1970, 45/55372; Nov. 14, 1970, 45/100049; Nov. 14, 1970, 45/112639; Nov. 14, 1970, 45/112640
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 4 Claims

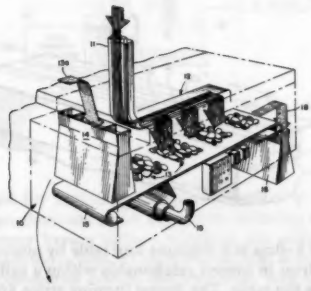


A microwave heater comprising a plurality of parallel arranged heating rectangular waveguides, each of which has a width slightly longer than that which cuts off electromagnetic waves to be used and at least one connecting waveguide member comprised of a bent waveguide and a pair of tapered waveguides fitted to both ends of said bend waveguide, thereby causing the entire assembly of waveguides to present a zig-zag form.

3,725,628
MICROWAVE APPLICATOR WITH THROUGHPUT SUPPRESSION GUIDES AT INPUT AND OUTPUT PORTS

Ray M. Johnson, Danville, Calif., assignor to Microdry Corporation, San Ramon, Calif.

Filed Oct. 29, 1971, Ser. No. 193,908
Int. Cl. H05b 9/06; H01p 3/12
U.S. Cl. 219—10.55 11 Claims

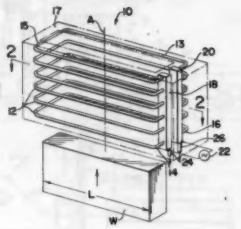


Wave guides are placed at the input and output ports of a microwave applicator for treating material whereby the material may pass through the throughput wave guides but the passage of microwaves is suppressed by the throughput wave guides without absorption of the microwave energy.

3,725,629
SLAB HEATING DEVICE

Robert V. Vickers, Shaker Heights, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed July 16, 1971, Ser. No. 163,403
Int. Cl. H05b 9/02
U.S. Cl. 219—10.79 6 Claims

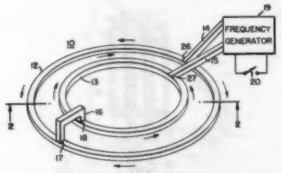


An induction heating unit is provided which is comprised of a plurality of substantially U-shaped or O-shaped tubular conductor sections having opposite ends interconnected one with a first tubular bus bar component and the other with a second tubular bus bar component parallel to the first. The conductor sections are disposed in spaced apart planes which are parallel to one another and perpendicular to the axis of the coil unit. The bus bar components are connected to opposite sides of a source of alternating current, whereby the several conductor sections are connected in electrical parallel. One of the bus bar components serves as an inlet header for coolant fluid for the heating unit and the other of the bus bar components serves as a discharge header for coolant fluid.

3,725,630
INDUCTIVE COIL FOR HEATING A LOOP OF CONDUCTIVE MATERIAL

Nicholas Gagliardi, Brooklyn, N.Y., assignor to Cycle-Dyne, Inc., Jamaica, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,515
Int. Cl. B23k 13/02
U.S. Cl. 219—10.79 3 Claims



An induction coil is provided for heating a loop of conductive material, the coil having first and second concentric closed inductive loops of different sizes to receive the loop of conductive material between them. Input leads are connected to the respective inductive loops and a jumper connects points on the inductive loops that are substantially at mid-positions respectively about the periphery of the associated inductive loops relative to the point of connection of one of the input leads. This provides a structure wherein current will flow through the loops in series and in opposite directions to provide uniform heating throughout a closed loop of conductive material.

3,725,631

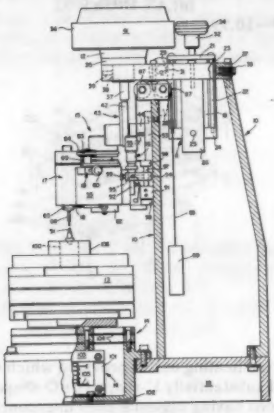
ELECTRO-MECHANICAL SERVO DRIVE

Thomas L. Angelucci, Cherry Hill; Joseph L. Angelucci, Deptford, both of N.J., and Dan Vilenski, Haifa, Israel, assignors to Kulicke and Soffa Industries, Inc., Fort Washington, Pa.

Filed Aug. 30, 1971, Ser. No. 176,110

Int. Cl. B23p *1/14*

U.S. Cl. 219—69 G **23 Claims**



An electro-mechanical servo drive for precisely moving a miniature EDM electrode into engagement with a workpiece including a precision micrometer lead screw having a drive wheel and a push rod. A movable spindle assembly biased into engagement with the lead screw to eliminate back lash from the spindle assembly and the lead screw, and a drive motor frictionally engaging the drive wheel to impart rotary motion thereto with transmitting vibratory motion.

3,725,632

MULTIPLE SPOT WELDING MACHINES

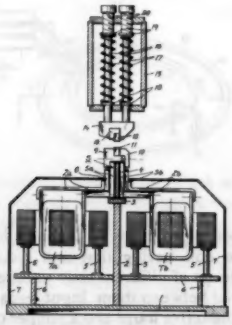
Josef Ritter, and Hans Gott, both of Graz, Austria, assignors to EVG Entwicklungs-und Verwertungsgesellschaft m.b.H., Graz (Steiermark), Austria

Filed March 16, 1971, Ser. No. 124,865

Claims priority, application Austria, March 25, 1970, 2800/70

Int. Cl. B23k *9/10*

U.S. Cl. 219—116 **6 Claims**



A multiple spot welding machine suitable for the manufacture of welded wire mesh for concrete reinforcement has two pairs of bus bars supported on a transverse wall extending upwardly from a base plate of the machine. Two rows of transformers, for feeding the two pairs of bus bars, are arranged one on each side of the transverse wall. A number of electrodes are shiftable along the bus bars to any one of which each electrode is connectable. A vertically movable spring loaded bridging electrode is provided above the electrodes on the bus bars.

3,725,633

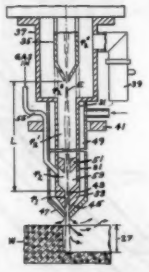
CORPUSCULAR BEAM IN THE ATMOSPHERE

Berthold W. Schumacher, Pittsburgh, and Robert E. LaCroix, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 756,654, Aug. 30, 1968, abandoned. This application Jan. 8, 1971, Ser. No. 105,113

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EB **14 Claims**



Apparatus is disclosed for producing a corpuscular beam in the atmosphere with which the beam may be caused to impinge deeply within the work, for example in cutting rocks. The apparatus has a small diameter for a substantial distance from the beam-exit aperture and produces a low pressure between the aperture and the reaction zone of the beam and the work so that the beam is relatively unscattered over a substantial distance. This desideratum is achieved by transmitting one or more fluids along the beam as it emerges from the aperture producing a jet-or-ejector-type pump action in the region where the beam emerges. The fluids may include a burnable fluid and oxygen which is ignited at the aperture. The heat produced by the burning further reduces the pressure between the aperture and the zone of reaction.

3,725,634

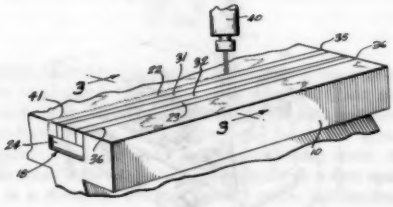
METHOD OF FORMING T-SLOTS IN A MACHINE TOOL TABLE

Kenneth H. Lane, Elm Grove, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Feb. 17, 1971, Ser. No. 115,978

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EM **5 Claims**



Forming T-slots in a machine tool table by positioning a pair of throat strips in spaced relationship within a suitable groove provided in the table. The throat forming strips are supported in desired position by a removable supporting filler bar and are maintained in intimate contact with the groove side wall by wedge strips. The joint formed by the contact of each throat strip and the adjacent side wall of the table groove is

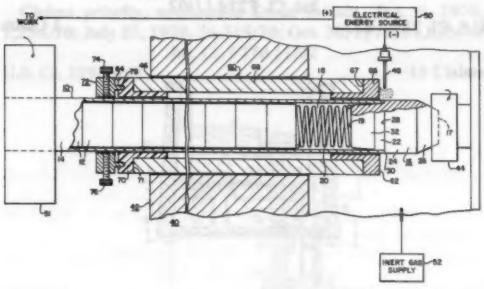
subjected to a beam obtained from an electron beam welder to fuse the contacting surfaces into a unit structure.

3,725,635

METHOD OF AND APPARATUS FOR WELDING AN END PLUG ONTO A NUCLEAR FUEL ELEMENT

Robert W. Fink, Saltsburg, and Eugene S. Boyko, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1971, Ser. No. 173,487
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 P 17 Claims



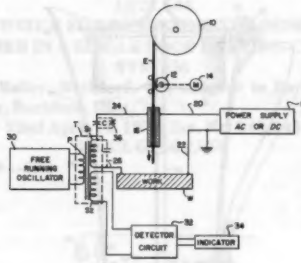
Welding methods and apparatus for bonding a metallic end plug into an end of a metallic fuel tube or rod for a nuclear reactor. Defects in the weld joint between the fuel tube and end plug are substantially reduced by arc welding in a chamber filled with an inert gas, disposing the welding electrode directly over the joint to be welded, deflecting plasma produced during the welding away from the body of the fuel tube, and directing the plasma into the joint.

3,725,636

AC-DC SHORT CIRCUIT WELDING INDICATOR

Tibor Endre Toth, Florence, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 8, 1972, Ser. No. 224,468
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 R 4 Claims



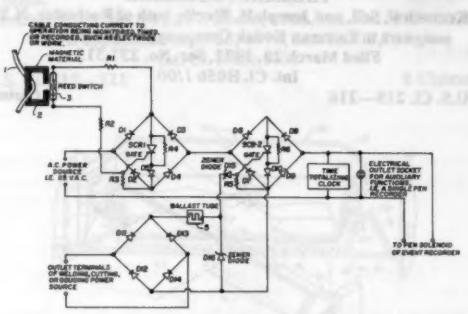
A circuit for indicating the occurrence of a short circuit between an electrode and a workpiece including an oscillator; a transformer having tertiary windings, the primary winding being connected across the oscillator output, a first secondary winding connected across the electrode and workpiece, a second secondary winding connected to a signal level detector; and a lamp which is caused to light where the signal level across the second secondary winding drops below a predetermined level representing the shorted condition.

3,725,637

VOLTAGE-CURRENT SENSING SYSTEM FOR WELDERS AND THE LIKE

Carl M. Wenrich, Reading, and Bernard W. Downs, Elverson, both of Pa., assignors to Weld-Record Corporation, Elverson, Pa.

Filed May 6, 1971, Ser. No. 140,873
Int. Cl. B23k *9/00*
U.S. Cl. 219—136 4 Claims



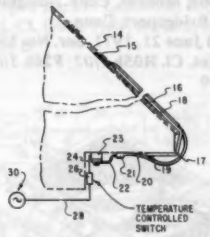
This invention relates to a system for making a record of the amount of work actually produced by an arc welder or similar machine for a given period of time. The arc welder may be energized, for example, for eight hours but may be actually welding for only four or five hours. The system includes a current sensor which records only when at least minimum arc currents flow, and a voltage sensor which records only when at least voltages sufficient to sustain an arc and which are greater than those at which short circuit occur. The simultaneous occurrence of both such currents and voltages is necessary for recording.

3,725,638

HEAT RADIATING ASSEMBLY AND APPARATUS FOR PERMITTING ICE BLOCKED WATER TO DRAIN OFF OF HOUSE ROOFS

Edward P. Solin, Ilion, and Russell Post, Fairfield, both of N.Y., assignors to Arctic Roof Deicing Corporation, Ilion, N.Y.

Filed June 1, 1971, Ser. No. 148,602
Int. Cl. H05b *1/00*
U.S. Cl. 219—213 22 Claims



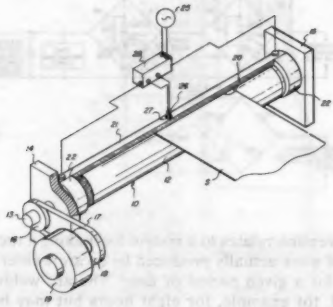
A heat radiating assembly and an apparatus using a plurality of heat radiating assemblies for melting ice on the roof thereby permitting ice blocked water to drain off of the roof. The heat radiating assembly comprises a flexible heat generating element, a shielding element for protecting the flexible heat generating element and for radiating heat produced by the flexible heat generating element, and an electric current source for heating up the flexible heat generating element. The roof ice melting apparatus utilizes a plurality of heat radiating assemblies with each one being spaced from the

others and each one extends inwardly and upwardly from at least one roof edge. When heated up, the heat radiating assemblies of the roof ice melting apparatus create water draining channels to permit ice blocked water to drain off the roof due to melting of the ice located adjacent each heat radiating assembly.

3,725,639
THERMAL PROCESSOR

Kenneth F. Seil, and Joseph H. Worth, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed March 23, 1972, Ser. No. 237,313
Int. Cl. H05b 1/00
U.S. Cl. 219—216 **8 Claims**

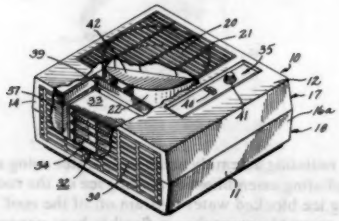


A thermal processing device comprises a roller having a metallic core and an outer layer of elastomeric plastic material which permits a sheet or strip of photosensitive material that is to be developed to be held and maintained in intimate contact with a heating element. The heating element comprises a ceramic resistance member which forms a semi-cylindrical shoe about the roller, the latter being maintained in intimate contact with the heating element. With such a structure, it is not necessary to maintain the heating element in a standby condition, because the heating element will be brought to the proper operating temperature so quickly that the sheet or strip of material that is to be processed can be fed into the nip of the heating element and the roller a few seconds after turning on of the electrical energy that is applied to the heating element.

3,725,640
ELECTRIC FAN HEATER

Raymond W. Kunz, Monroe, Conn., assignor to General Electric Company, Bridgeport, Conn.

Filed June 21, 1971, Ser. No. 154,777
Int. Cl. H05b 1/02; F24h 3/04
U.S. Cl. 219—370 **3 Claims**

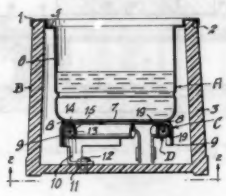


An electric fan heater of the space heating type including a housing having an air inlet opening in the top wall and an air outlet opening in the front wall with a heating element close thereto. A motor driven axial flow fan is utilized to provide a centrifugal air stream path through the fan heater and a shielding member is positioned between the fan propeller and air inlet opening to partially block the air inlet opening. The shielding member covers the area between the edge of the opening and a chord line across a portion of the opening the chord line being located less than half the distance from the edge of the opening to the center and in the half of the inlet opening closest the air outlet opening thereby widening the area of air flow path through the heating element.

3,725,641
ELECTRIC CUP HEATER

George E. Tilp, Short Hills, N.J., assignor to Adams Industries, Union, N.J.

Filed Aug. 13, 1971, Ser. No. 171,559
Int. Cl. F27d 11/02
U.S. Cl. 219—433 **1 Claim**

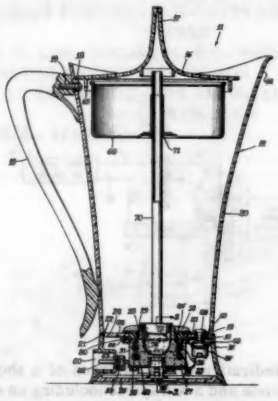


A metal cup to contain liquid to be heated has a heat distribution plate spot welded or brazed to the exterior of the cup bottom wall and said plate has a perimetral depending flange within which is brazed a heater coil and which has circumferentially spaced extensions providing legs for supporting the cup in an insulated cup-shaped housing, providing simplicity of construction, ease of assembly and economical heat transfer from coil to cup.

3,725,642
ELECTRIC COFFEE MAKER HAVING A PLASTIC HEATING VESSEL

Jack E. Weidner, Milwaukee, Wis., assignor to Oster Corporation, Milwaukee, Wis.

Filed July 10, 1972, Ser. No. 269,925
Int. Cl. F27d 11/02
U.S. Cl. 219—441 **10 Claims**



An electric percolator is disclosed having a plastic heating vessel, a plastic base and a heating assembly with a pump well which extends upwardly into the vessel through an aperture in the bottom of the vessel. threaded heating assembly is held in place against the plastic bottom of the heating vessel by a

mounting nut. The p plastic of the coffee maker is supported against the bottom of the plastic heating vessel by a metal bracket which has two arms that are secured to the base by screws and which has an aperture that surrounds surrounds upperwardly upwardly pump well and by a plurality of support posts which are integrally molded with the base.

3,725,643

LIQUID HEATING UNITS, CONTROL MEANS FOR SUCH UNITS AND VESSELS INCORPORATING HEATING UNITS

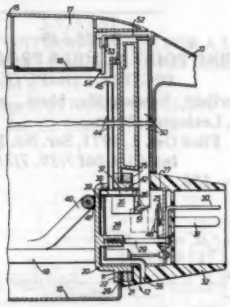
Georges Jean Louis Clausse, Laleham, England, assignor to The Hoover Company, North Canton, Ohio

Filed Jan. 4, 1971, Ser. No. 103,525

Claims priority, application Great Britain, Jan. 9, 1970, 1,254/70; July 27, 1970, 36,345/70; Oct. 30, 1970, 51,833/70

Int. Cl. F27d *11/02*

U.S. Cl. 219—441 **10 Claims**



Liquid heating units, specifically for beverage makers and kettles incorporate control mechanism including contacts for controlling an immersible heating element both to switch it off at a predetermined temperature, e.g. boiling, or if the heating element is not fully immersed. The control mechanism includes a thermomagnetic element the magnetic properties of which change at a predetermined temperature to release a magnet previously attracted thereto and which then falls by gravity to open the contacts. The element can be made sensitive to boiling liquid either by a direct heat conduction or by passage of vapor through a vapor tube to the element.

3,725,644

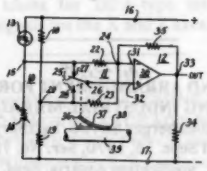
INPUT SWITCH FOR REVERSING THE SENSE OF AN AMPLIFIER IN A SINGLE LOOP HEATING-COOKING SYSTEM

Ronald L. Bailey, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed April 11, 1972, Ser. No. 243,043

Int. Cl. G05d *23/00*

U.S. Cl. 219—494 **12 Claims**



A single-pole, double-throw switch and a pair of input resistors connected in series between the alternative terminals of said switch may be employed between a pair of condition sensitive terminals and a pair of input terminals for an amplifier to reverse the sense of the amplifier output.

3,725,645

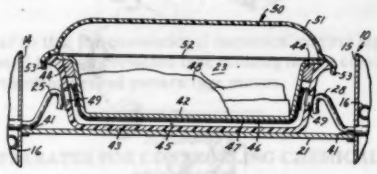
CASSEROLE FOR STORING AND COOKING FOODSTUFFS

Thomas S. Shevlin, White Bear Lake, Mich., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 781,157, Dec. 4, 1968, Pat. No. 3,608,627. This application Sept. 25, 1970, Ser. No. 75,711

Int. Cl. H05b *3/06*

U.S. Cl. 219—521 **8 Claims**



This invention is directed to a device and system for cooking foods from a refrigerated or a frozen state to an edible state directly in the refrigerated or frozen environment. One or more cooking receptacles or casseroles containing foodstuff are placed in a chamber maintained at desired refrigerated temperatures. A thermally insulated electric heating element either integrally formed with each receptacle or in direct contract therewith is connected to an electric circuit for the purpose of heating or cooking the food. The receptacles are thermally insulated and have a dish member on which the food is placed. In most systems it is preferred that the dish has a low heat capacity and high heat transfer characteristics so that substantially all of the heat produced by the element is transferred through the dish directly to the food. The heating elements if the casseroles are controlled by the circuit so that each casserole or a group of casseroles may be selectively energized to cook or heat the food while the chamber remains at refrigerated or freezing temperature and the remaining non energized casseroles are retained in frozen or refrigerated condition.

3,725,646

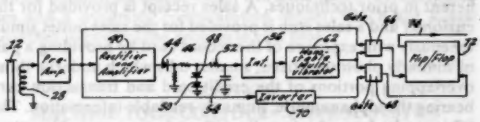
SYSTEM FOR REPRODUCING DIGITAL INFORMATION

David E. Smead, Camarillo, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed April 19, 1971, Ser. No. 135,070

Int. Cl. G06k *7/08*; G11b *5/00*

U.S. Cl. 235—61.11 D **17 Claims**



A system is provided for reading from a medium signals representing digital information and having excursions between positive and negative peaks in a pattern dependent upon the digital information and for reproducing the digital information from such signals. The system may rectify the signals to produce unidirectional signals. The system then converts the unidirectional signals to signals having amplitudes compressed such as by a logarithmic function relative to the amplitudes of the unidirectional signals. The system then integrates the logarithmic signals in an integrator having stable and uniform characteristics over a wide band of frequencies. The system uses the integrated signals and the logarithmic signals to produce control signals at the peaks of the am-

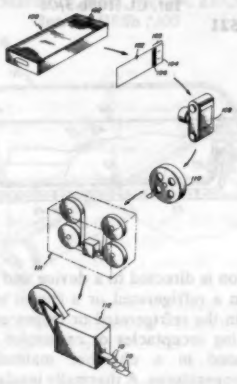
plitudes of the logarithmic signals. The system then uses the control signals to reproduce the digital information.

3,725,647

PHOTOGRAPHIC CREDIT CARD SYSTEM

Clarence M. Retzky, Wellesley, Mass., assignor to Insta-Datic Corporation, Wellesley, Mass.

Filed Oct. 19, 1970, Ser. No. 81,698
Int. Cl. G06k *19/00*
U.S. Cl. 235—61.12 R **13 Claims**



A credit card system which includes a transparent credit card bearing information identifying the credit card holder both in alphanumeric and digital notation. The card is used in conjunction with a conventional "IBM" record card which has been coated with a self-developing and self-fixing light sensitive film. In use, as at a retail sales location, the digital information portion of the credit card is aligned with a predetermined photosensitized portion of the record card. Information relating to the amount and/or character of the transaction is carried by an input device which may consist of a transparent card bearing the sales information both in alphanumeric and digital form. The input card is overlaid on the aligned "IBM" record card and credit card so that the digital information relating to the transaction is in alignment with another photosensitized segment of the record card. The cards are retained in their properly aligned configuration by a jig incorporated into a printer box which exposes the photosensitized record cards through the overlapping digital portions of the credit card and transaction card. After exposure and self-development, the imprinted record card then may be processed directly in commercially available data processing machines avoiding many of the manual conversion steps inherent in prior techniques. A sales receipt is provided for the customer and a sales stub is provided for the sales outlet simultaneously with exposure of the record card by providing a pair of similarly photosensitized, smaller tabs which underlie those overlapping portions of the credit card and transaction card bearing the alphanumeric, humanly readable information. The tabs may be formed integrally with and as a removable extension of the record card or, alternatively, may be separate from the record card.

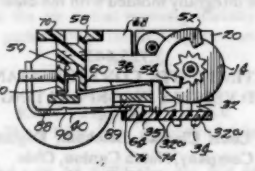
3,725,648

ELECTROMAGNETIC REGISTER APPARATUS

Russell M. Schmick, Mequon, and Henry Jacyno, Milwaukee, both of Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.

Filed June 24, 1971, Ser. No. 156,352
Int. Cl. G06m *1/10*
U.S. Cl. 235—92 C **20 Claims**

An electromagnetically operated register is disclosed of the type having a U-shaped pole piece with one leg extending through the coil. The armature is linked to a separate ratchet arm, which is formed of plastic or other lightweight material and biased to the locking position by a leaf spring. The core slidably engages in the frame and serves as the support for the



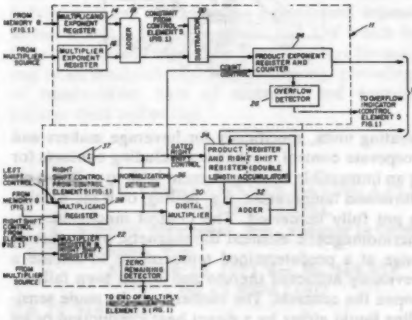
coil and as a keeper for the ratchet-operating mechanism, with a single pin retaining these components in assembled relation with the frame. The number wheels and index pinions comprise a subassembly, including the two pinion axles, having journal and snap engagement with the main frame.

3,725,649

FLOATING POINT NUMBER PROCESSOR FOR A DIGITAL COMPUTER

Alan J. Deerfield, Newtonville, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 1, 1971, Ser. No. 185,498
Int. Cl. G06f *7/39*, *7/385*
U.S. Cl. 235—156 **3 Claims**



A processor for digital numbers, specifically a multiplier using a "floating point" technique, is disclosed. The disclosed processor is adapted to determine the product of two unnormalized digital numbers, each one of such numbers being expressed as a mantissa and a signed exponent of a selected base, and to express such product as a mantissa with the greatest possible degree of significance and a signed exponent of the base. The processor is operative simultaneously to determine the sum of the exponents and the partial products of the mantissas of the numbers being processed and to normalize one of such mantissas, adjusting the sum of the exponents correspondingly. Means are also provided to stop the multiplication process as soon as all significant partial products are determined.

3,725,650

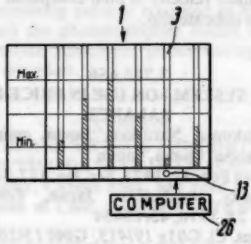
METHOD AND ARRANGEMENT FOR OPTICALLY REPRESENTING INDUSTRIAL MANAGEMENT DATA

Franz Gelder, Gabelsberger Str. 36, Salzburg, Austria

Filed Sept. 15, 1970, Ser. No. 72,332
Claims priority, application Austria, Sept. 15, 1969, 8735
Int. Cl. G06f *15/20*
U.S. Cl. 235—151.3 **25 Claims**

Data obtained in industrial production or office work, such as rate or quantity of output of a machine or a worker, are applied to computers for deriving electric signals characterizing

the operation with regard to efficiency, profitableness, etc. Indicator boards are provided having electroluminescent strips



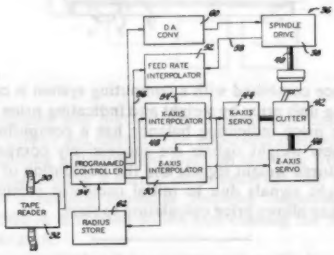
or discs, or cathode ray tubes the extent of the luminous portions of which are controlled by the computers.

3,725,651

NUMERICAL CONTROL SYSTEM FOR A LATHE

Hymie Cutler, Detroit, Mich., assignor to The Bendix Corporation, Southfied, Mich.

Filed Aug. 5, 1970, Ser. No. 62,231
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.11 **15 Claims**



A continuous-path numerical system controls the position of the cutter of a lathe with respect to the workpiece and the rate of rotation of the work spindle in accordance with a series of numerical commands encoded on a punched tape. Each command, in addition to position information, includes information relating to the desired rate of movement of the cutter over the workpiece in surface feet per minute and the desired rate of advancement of the cutter in terms of inches per revolution. The commands controlling the position of the cutter with respect to the center line of the spindle are continuously monitored and the quantity representative of the commanded separation is divided into the programmed surface feet-per-minute number to derive a number used to control the spindle motor drive. This system additionally calculates a feedrate number based on the incremental distances of motion along the X and Z axes called for by a particular command and the inches per revolution number. A pulse train generated by a transducer which senses the rate of rotation of the spindle is multiplied by this feedrate number to derive command pulse trains for DDA-type interpolators which generate control signals for the X and Z axes.

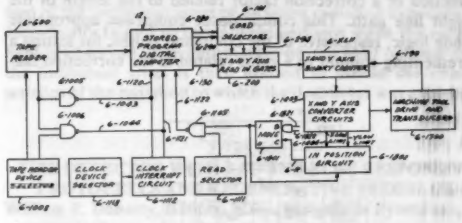
3,725,652

COMPUTER CONTROLLED MACHINE TOOL SYSTEM WITH STORED MACRO LANGUAGE PROGRAM FOR EFFECTING PATTERN TYPE PUNCHING OPERATIONS

John Konvalina, Williamsville, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed June 1, 1971, Ser. No. 148,829
Int. Cl. G06f *15/46*; B23q *21/00*
U.S. Cl. 235—151.11 **2 Claims**

In a computer controlled punching machine system a macro language program of the type conventionally used to generate commands for executing geometric patterns during tape preparation is supplied as part of the control program for the



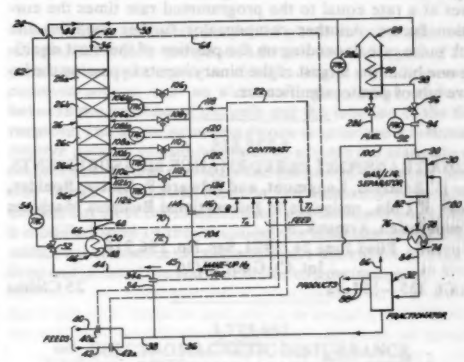
computer so that the conventional numerical control tape can be replaced by an abbreviated tape utilizing macro commands for representing desired pattern type moves.

3,725,653

APPARATUS FOR CONTROLLING CHEMICAL PROCESSES

Norman L. Carr; Sheldon J. Kramer, and Donald L. Stahlfeld, all of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed April 11, 1968, Ser. No. 720,644
Int. Cl. G06g *7/58*
U.S. Cl. 235—151.12 **11 Claims**



Method and apparatus for controlling complex chemical processes comprising the use of a detailed model, a dynamic simulation, and intermediate steps to generate both a simplified monitoring model which will anticipate process responses and a dynamics compensation model, which are joined together to control the process in real time.

3,725,654

MACHINE TOOL CONTOUR CONTROL SYSTEM

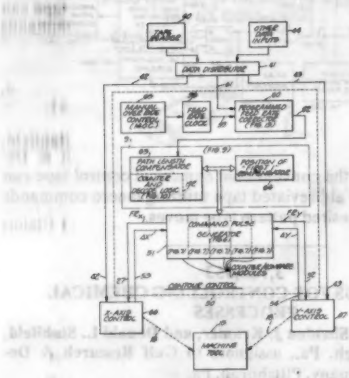
Robert W. Tripp, Tuckahoe, N.Y., assignor to Inductosyn Corporation, Valhalla, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,582
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.11 **20 Claims**

A machine tool contour control system for directing a tool at a preselected substantially constant speed along a straight line path defined by distance components parallel to orthogonal axes. For each axis, a drive means toward the tool through a unit of distance in response to a command pulse for that axis. A generator simultaneously provides to each separate drive means a train of command pulses equal in number to the distance to be moved along the corresponding axis, the distance components being specified by binary inputs. The command pulse rates, and hence the tool speed, de-

pend on the rate at which clock pulses are supplied to the generator.

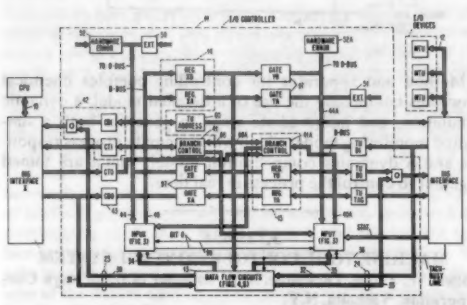
A path length compensator controls the clock pulse rate as a function of a correction factor related to the length of the straight line path. This compensator comprises appropriate decode logic, responsive to the command pulses, for setting a decrementing counter to a value related to the correction factor. A comparator and a binary counter, driven at a programmed rate directly related to the preselected speed, cooperate with the decrementing counter to provide clock pulses at a rate equal to the programmed rate times the correction factor. Another compensator further modifies the clock pulse rate depending on the position of the most significant one bit in the largest of the binary inputs bypassing the inactive bits of greater significance.



3,725,655
MEDIA TRANSPORT PERFORMANCE MEASUREMENTS

Gene H. Edstrom, Longmont, and Edward P. Lutter, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 24, 1971, Ser. No. 156,216
Int. Cl. G06f *15/20*
U.S. Cl. 235—151.32 25 Claims

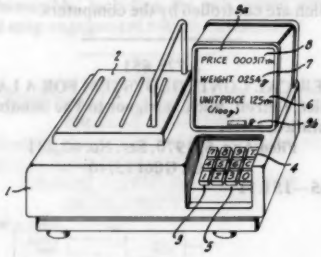


Displacement between two signals on a record media is precisely measured by counting the number of capstan tachometer signals occurring between the two signals. This count is time metered per tachometer cycle to calculate an average velocity. In addition, elapsed times between immediately adjacent tachometer signal changes and the signals are measured. The average velocity per tachometer cycle is then multiplied by the total number of tachometer cycles and those portions of a tachometer cycle occurring adjacent the signals. With the known distance per tachometer cycle, the total elapsed time is a precise indication of the distance between the two signals. This method is also used for measuring media slip. Upon occurrence of a first signal, the media is stopped. After stopping, the media is started, all the while measuring the distance the media is moved. Distance measured at a constant velocity is then compared with the latter measurement to indicate slip.

3,725,656
COMPUTING SYSTEM FOR USE IN PRICE INDICATING BALANCE

Yoshitakaka Fukuma, Nara-ken, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 22, 1971, Ser. No. 117,346
Claims priority, application Japan, Feb. 23, 1970, 45/15433; Feb. 23, 1970, 45/15434
Int. Cl. G01g *19/413*; G06f *15/20*
U.S. Cl. 235—151.33 12 Claims

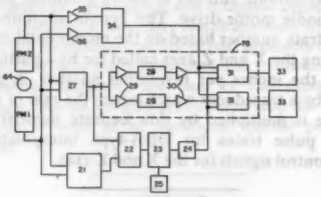


A balance combined with a computing system is capable of multiplying unit price by weight and indicating price in digital form. The price indicating balance has a computing system wherein new weight signals are successively compared with previous stored weight signals and the fluctuation of the measured weight signals due to initial oscillator motion of the weighing pan allows price calculation to start.

3,725,657
METHOD AND APPARATUS FOR DETERMINING EFFICIENCY IN A LIQUID SCINTILLATION COUNTING SYSTEM

Barton H. Laney, Deerfield, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Continuation-in-part of Ser. No. 792,717, Jan. 21, 1969, Pat. No. 3,626,187. This application June 11, 1971, Ser. No. 152,092
Int. Cl. G01j *39/18*
U.S. Cl. 250—71.5 21 Claims



In a liquid scintillation system utilizing plural photomultiplier means, a method and apparatus for determining efficiency of coincident pulse detection. The invention is particularly useful for compensating for color quenching in liquid samples. Various incremental counting efficiency levels are associated with asymptotic functions in a two dimensional matrix in which the abscissa and ordinate correspond to the pulse heights of each of a pair of coincident pulses from different photomultiplier means. An efficiency determining point is located in the matrix based on the sum of the pulse heights of

each of the coincident pulses as well as on the amplitude of the smallest pulse of the coincident pulses. The single counting efficiency level associated with a function passing through the efficiency determining point is recorded as the level of efficiency at which the photomultiplier means detect scintillations that generate coincident pulses having pulse heights equal to those recorded.

3,725,658

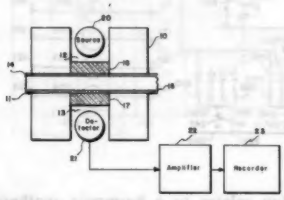
APPARATUS AND METHOD FOR CONTINUOUSLY DETECTING OXYGEN IN A GAS STREAM

Charles C. Stanley, Canoga Park, and John L. Kropp, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 85,029, Oct. 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 27,963, April 13, 1970, abandoned. This application Jan. 18, 1971, Ser. No. 106,987

Int. Cl. G01n *21/26, 21/38*

U.S. Cl. 250—71 R **9 Claims**



An apparatus and method for continuously detecting oxygen in a carrier gas stream. The apparatus employs a sensor film comprising a fluorescent material emitting from 3000 – 8000 A, dissolved in a carrier or solvent, the film being supported on a suitable substrate. Exciting radiation of about 2000 – 6500 A is applied to the film causing the fluorescent material to emit.

Oxygen contained in the gas stream is rapidly dissolved into, and purged out of the film. The dissolved oxygen will quench the fluorescent emission, and the extent of quenching is proportional to the oxygen content of the gas stream.

The dissolving and purging cycle occurs with sufficient speed to enable the oxygen analysis of breath to be determined on a real time basis.

3,725,659

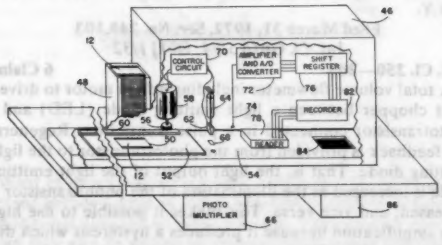
THERMOLUMINESCENCE DOSIMETER SYSTEM

John C. Culley, Idaho Falls, Idaho, assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed March 16, 1971, Ser. No. 124,686

Int. Cl. G01t *1/11*

U.S. Cl. 250—71 R **2 Claims**



A system for obtaining radiation spectrum information utilizing a single thermoluminescent (TL) dosimeter. After subjecting the single TL dosimeter to radiation in a manner so that a plurality of areas of the dosimeter experience radiation exposures which differ from each other, such as by overlaying the dosimeter with one or more radiation filters, at least a portion of the individual areas of differing radiation exposure are individually heated to thermoluminescence while the emitted light is observed. The information on the light emitted from the individual areas is then utilized to unfold the characteristics of the radiation to which the dosimeter was exposed.

3,725,660

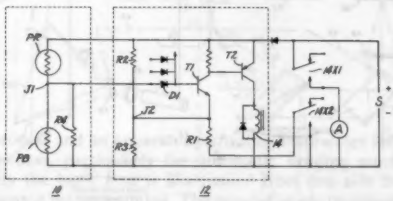
FIRE DETECTOR WITH RED AND BLUE RESPONSIVE PHOTOCELLS AND REGENERATIVE FEEDBACK

William F. Doherty, Halifax, Mass., assignor to Pyrotector, Incorporated

Continuation of Ser. No. 823,584, May 12, 1969, abandoned. This application May 13, 1971, Ser. No. 143,215

Int. Cl. G08b *21/00*

U.S. Cl. 250—83.3 H **2 Claims**



A fire detector in which a pair of photo-resistive cells which respond differently to radiation from a fire and a pair of fixed resistors are connected in voltage divider circuits across a common source, with an alarm actuating device connected between the junction of the cells and the junction of the fixed resistors. The alarm actuating device responds to a reversal of relative polarity of said junctions to actuate the alarm. In one embodiment of the invention the portion of the alarm actuation means connected between the junctions is the base-emitter circuit of the first transistor of a transistor amplifier. In a modified form of the invention, on actuation of the alarm, additional resistance is connected into the circuit to shift the drop-out point of the alarm actuator to a desired point.

3,725,661

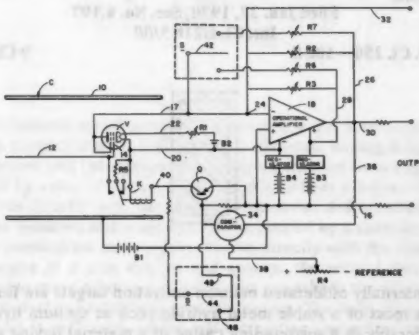
ELECTROMAGNETIC DISTURBANCE NEUTRALIZATION RADIATION DETECTOR

William G. Gripentog, Las Vegas, Nev., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 1, 1971, Ser. No. 177,023

Int. Cl. G01t *1/18*

U.S. Cl. 250—83.6 R **9 Claims**



A radiation detector of the Neher-White type which automatically neutralizes induced negative charges on the elec-

trometer tube control grid which shut off the electrometer tube. The detector includes means for establishing a voltage of one polarity in response to plate current and voltage of opposite polarity in response to an absence of plate current and means for connecting the control grid to a reference potential for draining the negative charge in response to the voltage of opposite polarity.

3,725,662

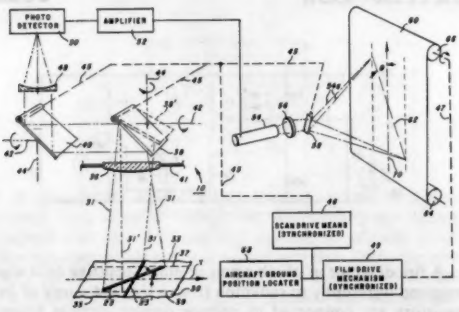
INFRARED SCANNER SYSTEM HAVING INCREASED RESOLUTION AND METHOD OF USING SAME

Ronald F. Merkel, Euless, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 86,013, Nov. 2, 1970, abandoned. This application Oct. 7, 1971, Ser. No. 187,245

Int. Cl. G01t 1/16

U.S. Cl. 250—83.3 H **13 Claims**



Disclosed is an airborne optical scanning system and a method for using same wherein the resolution and velocity-to-height ratio is improved by modifying the effective field-of-view scanned by said scanning system. The scanner is rotated, preferably more than 45° from its normal axis, such that the scan lines cross the target at an angle less than 90° with the track, that is, the direction of flight, of the aircraft. The film transport portion of the system is disposed such that a modulated light beam responsive to the signal of the detector is scanned across the film along a line that forms an angle with respect to the track of the film that is identical to the angle between the track of each scan line on the target of the aircraft.

3,725,663

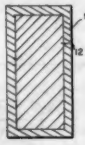
INTERNALLY MODERATED HEAT SOURCES AND METHOD OF PRODUCTION

Kenneth E. Mayo, Nashua, and William J. Fretague, Amherst, both of N.H., assignors to Sanders Nuclear Corp., Nashua, N.H.

Filed Jan. 27, 1970, Ser. No. 6,197

Int. Cl. G21h 5/00

U.S. Cl. 250—106 S **9 Claims**



Internally moderated neutron activation targets are formed of a mass of a stable metal hydride such as thulium hydride preferably in a surrounding casing of a material having a low thermal neutron cross section and a short half life. Heat sources are formed from the targets by irradiation with neutrons with the hydrogen atoms acting as a moderator to reduce the effect of flux depression during neutron activation.

3,725,664

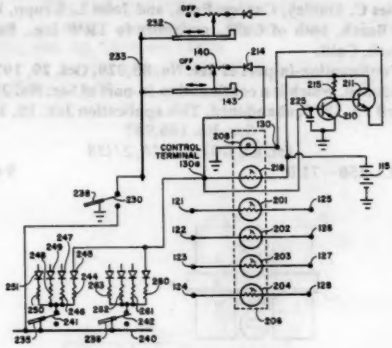
RAPID RESPONDING PHOTOELECTRIC ATTENUATOR SYSTEM

Richard H. Peterson, Palos Park, Ill.

Division of Ser. No. 17,387, March 9, 1970, abandoned. This application Sept. 13, 1971, Ser. No. 179,932

Int. Cl. G01j 1/32; H05f 1/40; H01j 39/12

U.S. Cl. 250—205 **1 Claim**



The invention relates to a harmonic synthesis organ in which a complex wave tone generator generates signals corresponding to the frequencies of the fundamentals and harmonic partials. The complex tones are gated and are collected on a plurality of headers, each header corresponding to a particular harmonic partial. The headers are subdivided into groups of approximately one octave of contiguous tones and the groups are individually attenuated by a multiple attenuator controlled by a control element which may be manually operated draw bar. The outputs of the attenuators are connected to sharp cut off filters which remove all of the natural harmonics from the complex waves, and pass to the amplifier sine waves corresponding to the various partials. A preferred multiple attenuator system employs a plurality of photo resistors associated with a lamp, the intensity of which is controlled by a related draw bar. A lamp control circuit is provided to improve the responsiveness of the lamp to changes in draw bar position. Additional stop control means are provided for controlling the attenuators from either draw bars or from an alternate control system. In the embodiment shown, only a single key contact is associated with each playing key of the organ.

3,725,665

PULSE GENERATOR

Robert Eugene Talmo, Pasadena, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

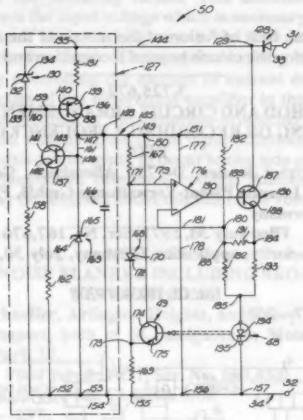
Filed March 31, 1972, Ser. No. 240,103

Int. Cl. G01d 5/34; G01j 1/32

U.S. Cl. 250—205 **6 Claims**

A total volume flowmeter including a fluid motor to drive a light chopper between a light emitting diode (LED) and a phototransistor connected in a pulse transmitter. Regenerative feedback is provided from the phototransistor to the light emitting diode. That is, the light output of the light emitting diode is increased as the illumination of the phototransistor is increased, and vice versa. This makes it possible to use high gain amplification because it produces a hysteresis which discriminates against false output pulses which would otherwise occur with the use of high gain amplification because of vibration induced by external means. A source of potential and a resistor may be connected in series with the pulse transmitter,

both the source of potential and the resistor, if desired, being positioned at a remote location. A pulse counter is connected across the resistor to an indicator which, if desired, may be calibrated in total volume flow. An amplifier is connected from the phototransistor to a transistor switch in series with



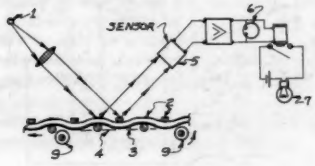
the LED. The switch and the LED are connected across the line, whereas the remainder of the circuit is connected across a voltage regulator. Putting the LED across the line improves voltage regulation, pulse generation reliability circuit sensitivity, and the square shape of the output wave.

3,725,666

ELECTRO-OPTICAL DETERMINATION OF WEAR OF PAPER MAKING SCREEN

Rainer Berthold, Zum Jungenstr. 16, Frankfurt am Main, Germany

Filed June 17, 1968, Ser. No. 737,702
Int. Cl. G01n *21/16, 21/32*
U.S. Cl. 250—219 DF **6 Claims**



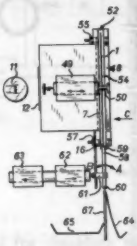
Wear of paper making screen is determined by utilizing increased abraded areas of screen wires for greater reflection of a light beam directed on moving screen. The reflected general beam may also be shifted by reduced thickness of the screen to further affect output of a light sensor, positively on negatively, for comparisons in order to reduce error due to dirty instrument components.

3,725,667

BANK NOTE TESTING APPARATUS

Hermann Schwartz, CH-8134 Adliswil, Switzerland, assignor to Siegfried Peyer, Haus Luna Rock, Bach, Switzerland

Filed Oct. 14, 1971, Ser. No. 189,100
Claims priority, application Switzerland, Oct. 20, 1970, 15433/70
Int. Cl. G01n *21/30*
U.S. Cl. 250—219 DQ **13 Claims**



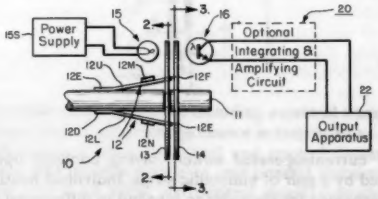
A process and an apparatus for testing bank notes for their genuineness, particularly for automatic vending machines, wherein the bank note is illuminated from one side from a light source through a mask. The printed image on one side of the bank note is divided by the mask into several test fields. The reflected light from each test field is received by one of a plurality of large area photoelectric cells, which are so connected that departures from a given value are added together to form an error signal.

3,725,668

ROTATIONAL SPEED SENSOR

Kenneth W. Padgitt, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 28, 1971, Ser. No. 157,524
Int. Cl. G01d *5/34*
U.S. Cl. 250—231 R **3 Claims**



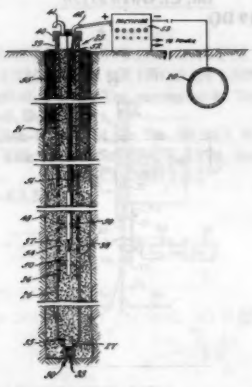
A rotational speed sensor for producing a d.c. level output signal proportional to shaft speed is disclosed having a light responsive unit (phototransistor) which is masked from a light source by a pair of slotted discs. One disc defines windows and revolves directly with the shaft and the other defines shades for the windows and is mounted to be rotated by a centrifugal force mechanism mounted to revolve directly with the shaft. By means of a cam surface and groove, the second disc is caused to move relative to the first disc to unshade the window progressively as rotational speed increases. The light responsive unit is preferably of the self-integrating (long time constant) type to time average its output and produce the d.c. signal directly.

3,725,669

DEEP ANODE BED FOR CATHODIC PROTECTION

Joe F. Tatum, 2600 Mimosa Lane, Hattiesburg, Miss.

Filed Dec. 14, 1971, Ser. No. 209,517
Int. Cl. H01r 3/06
U.S. Cl. 307—95 11 Claims



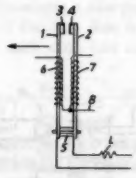
The method and apparatus for placing an impressed current or sacrificial anodes in a deep bed to provide cathodic protection of underground metallic structures and for easily replacing anodes which have been expended.

3,725,670

CURRENT-OPERATED SWITCH

Neville Ryland Davis, Chignal Grange, Chignal Smealy, Chelmsford, CM1, 4SZ, England

Filed Sept. 14, 1971, Ser. No. 180,262
Claims priority, application Great Britain, Sept. 24, 1970, 45,675/70
Int. Cl. H01h 35/00
U.S. Cl. 307—117 7 Claims



A current-operated switch having contacts opened and closed by a pair of bimetallic strips. Individual heating means are provided for the strips to respond to differential operating currents, a difference of one sign closing the contacts and a difference of the opposite sign opening the contacts. The switch draws a constant total current from a supply and is particularly suitable for operation by a differential transistorized amplifier.

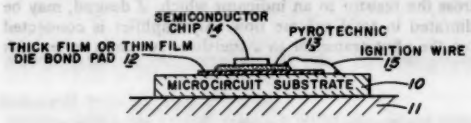
3,725,671

PYROTECHNIC ERADICATION OF MICROCIRCUITS

Frank Z. Keister, Culver City, and John B. Rust, Malibu, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 2, 1970, Ser. No. 90,209
Int. Cl. C06b 19/02; H03k 17/84; H05k 1/18
U.S. Cl. 307—202 5 Claims

An anticompromise pyrotechnic eradication thin film circuit module having thin films of perfluoropolymer and metal thereon in sufficient quantity to produce a pyrotechnic reaction to cause heat of fusion of the metals of the thin film circuit to destroy the circuit beyond recognition and repair.

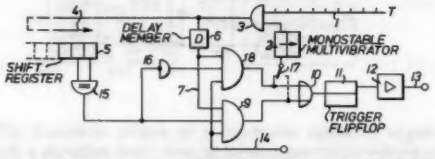


3,725,672

METHOD AND CIRCUIT ARRANGEMENT FOR DISPLAYING OR RECORDING A SEQUENCE OF BINARY BITS

Ernst Gottfried Reuter, D-7753 Allensbach, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed July 30, 1971, Ser. No. 167,676
Claims priority, application Germany, July 30, 1970, P 20 37 959.3
Int. Cl. H03k 19/08
U.S. Cl. 307—208 5 Claims



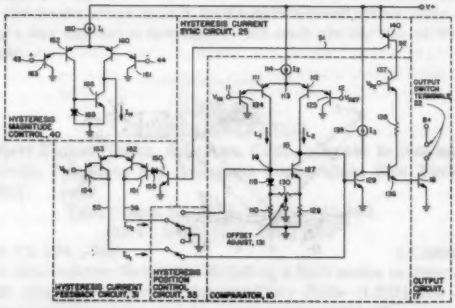
A method and circuit for producing a representation of a sequence of binary bits, or a binary word, in the form of a series of changes in the state, or value of a signal, by causing the interval between two successive state changes to have one length when successive binary bits have the same value and a different length when successive binary bits differ from one another in value.

3,725,673

SWITCHING CIRCUIT WITH HYSTERESIS

Thomas M. Frederiksen, Scottsdale, and Ronald W. Russell, Mesa, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 16, 1971, Ser. No. 171,995
Int. Cl. H03k 5/20, 3/26; H03f 3/68
U.S. Cl. 307—235 R 12 Claims



There is disclosed a switching circuit with a controllable hysteresis in which the hysteresis is introduced into the circuit through a feedback circuit which is connected to an internal node of the switching circuit. The input to the switching circuit is therefore independent of the hysteresis feedback circuit. The switching circuit is comprised first of a comparator which includes a differential amplifier, a differential-to-single-ended convertor, and ON-OFF biased output circuitry such that when an input signal is above a predetermined reference

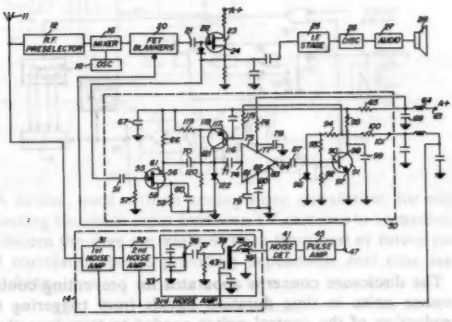
voltage, the switch is in an "open" condition and such that when the input signal falls below this predetermined reference voltage, the switch is in a "closed" or conducting condition. Hysteresis is introduced into the comparator circuit by selectively adding a predetermined amount of current to one or the other of the output nodes of the differential amplifier in the comparator circuit during times correlated with the operating condition of the switching circuit. This additional current raises or lowers the input voltage which is necessary to change the condition of the switching circuit and thus introduces a hysteresis into the circuit. The magnitude of the hysteresis is adjustable by controlling the amount of current delivered to the output nodes of the differential amplifier in the comparator. By the application of the hysteresis-producing current to the appropriate output nodes of the input differential amplifier, the hysteresis can be made to occur to one side or the other of the aforementioned reference voltage. Additionally, the hysteresis may be centered about this reference voltage.

3,725,674

IMPULSE NOISE BLANKER INCLUDING BROADBAND LEVEL SENSING

Dennis R. Schaeffer, Arlington Heights, and Larry R. Wright, Mount Prospect, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed July 8, 1971, Ser. No. 160,854
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **9 Claims**



An impulse noise blanking circuit for decreasing the impulse noise in a receiver includes a level sensing circuit coupled to a stage in the signal path following the blanking elements, and to at least one amplifier stage in the noise amplifiers which amplify the impulse noise signals. The level sensing circuit senses the level of the on-channel and adjacent channel energy in the signal path and develops a level sensing signal. The level sensing signal is coupled to the noise amplifiers to vary the gain in accordance with the level sensing signals, thereby reducing the blanking rate and the resultant receiver degradation due to an excessive blanking rate. The level sensing circuit includes a field effect transistor amplifier stage and feedback circuitry to minimize the production of undesired intermodulation producing signals therein.

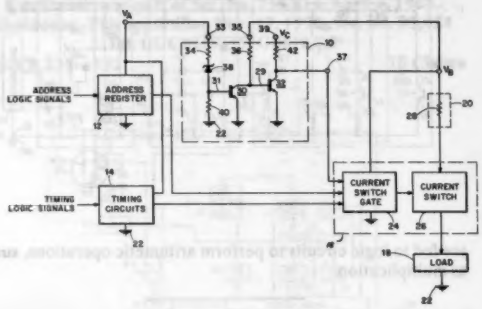
3,725,675

POWER SEQUENCING CONTROL CIRCUIT

Richard E. Olsen, Framingham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed March 29, 1971, Ser. No. 128,836
Int. Cl. H02h *7/20*; H03k *17/30, 17/56*
U.S. Cl. 307—238 **9 Claims**

Current applied to a load by means of a first voltage is disabled by control means in response to a change of a second voltage by a predetermined value. The control means is powered by the first voltage and includes two stages, a first for detecting a change of the second voltage and the second responsive to such change and powered by the first voltage for generating a signal for disabling the current applied to the load.

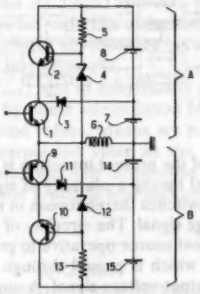


3,725,676

ELECTRONIC AMPLIFIER CIRCUIT

Gerard Melchior, Paris, France, assignor to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

Filed July 27, 1971, Ser. No. 166,434
Claims Priority, application France, July 27, 1970, 7027652
Int. Cl. H03k *17/00*; H01j *29/70*
U.S. Cl. 307—255 **11 Claims**



An electronic amplifier circuit including a control transistor connecting a load to a low voltage source in response to a control signal below a prescribed level and control means for switching a high voltage source to said control transistor to energizing said load when the control signal exceeds the prescribed level.

3,725,677

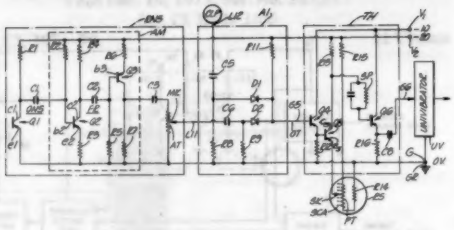
COMPUTER UTILIZING RANDOM PULSE TRAINS

Reed C. Lawlor, 412 W. Sixth St., Los Angeles, Calif.

Division of Ser. No. 742,619, July 5, 1968, Pat. No. 3,612,845.
This application March 24, 1971, Ser. No. 127,633
Int. Cl. H03k *5/00*
U.S. Cl. 307—260 **15 Claims**

Noise signals from a diode and clock pulses from a clock pulse source are fed to input legs of a logic circuit such as an AND gate, causing pulses of variable amplitude to appear in the output of the circuit. A threshold circuit suppresses pulses having amplitudes below a predetermined level. The remaining pulses trigger a univibrator thus causing pulses to be generated at random times in synchronous with clock pulses

thereby forming a train of synchronous random pulses. Trains of random pulses from several such random pulse generators



are fed to logic circuits to perform arithmetic operations, such as multiplication.

3,725,678

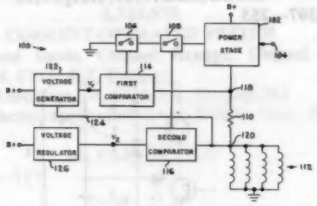
CIRCUIT FOR PROVIDING MULTIPLE LEVEL OUTPUT VOLTAGE SIGNAL IN RESPONSE TO A REMOTELY SENSED VOLTAGE VARIATION AND HAVING AUTOMATIC LEVEL SWITCHING FEEDBACK

Junuthula N. Reddy, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 130,349, April 1, 1971. This application May 7, 1971, Ser. No. 141,182

Int. Cl. H03k *1/14*

U.S. Cl. 307—264 **4 Claims**



The circuit of the present invention is operative to produce an output signal having a plurality of signal levels and which automatically switches therebetween in response to a remotely sensed voltage signal. The circuitry of the present invention includes a current source operative to provide a known quantity of current which is passed through a resistive means to establish the output voltage signal. A current sink is provided in parallel with the resistive network and is selectively operative or inoperative to vary the amount of current flowing from the current source through the resistive network. Means are provided to sense the remote voltage and to control the current sink in response to the sensed voltage. The sensed voltage is also applied to the resistive network through a unidirectional current flow device to establish within the resistive network a voltage which corresponds to the sensed voltage whereby a decrease in the sensed voltage will automatically produce a corresponding decrease in the voltage output signal.

3,725,679

FAIL-SAFE SIGNAL SHAPING CIRCUIT

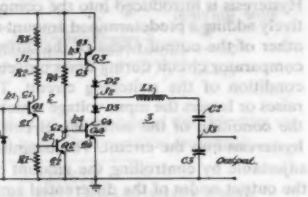
John O. G. Darrow, Westmoreland, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Sept. 15, 1971, Ser. No. 180,635

Int. Cl. H03k *5/01*

U.S. Cl. 307—268 **7 Claims**

This disclosure relates to a fail-safe signal shaping circuit which removes the harmonic producing portions from a square-wave input signal. The signal shaping circuit includes an electronic switching circuit and a series resonant L-C circuit for transforming the leading edge of the square-wave input signal into one half cycle of a cosine wave and for trans-



forming the trailing edge of the square-wave input signal into another half cycle of a cosine wave.

3,725,680

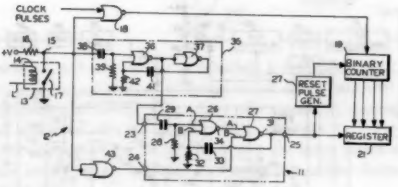
APPARATUS FOR DIGITIZING NOISY TIME DURATION SIGNALS WHICH PREVENTS ADVERSE EFFECTS OF CONTACT BOUNCE

John R. Silva, Rehoboth, Mass., assignor to General Signal Corporation, New York, N.Y.

Filed Jan. 3, 1972, Ser. No. 214,934

Int. Cl. H03k *5/153, 3/10, 3/284*

U.S. Cl. 307—268 **4 Claims**



The disclosure concerns apparatus for preventing contact bounce noise in time duration signals from triggering the production of the control pulses needed to transduce those signals into digital form. It also concerns a special gated one-shot multivibrator for that apparatus which consists of two NOT-type logic gates and passive resistance and capacitance elements.

3,725,681

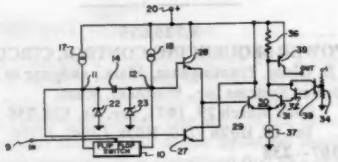
STABILIZED MULTIVIBRATOR CIRCUIT

Thomas M. Frederiksen, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 71,126, Sept. 10, 1970, abandoned. This application Sept. 1, 1971, Ser. No. 177,152

Int. Cl. H03k *3/284, 3/282, 5/04*

U.S. Cl. 307—273 **15 Claims**



An integrated circuit multivibrator provides a stable time constant under varying ambient temperature conditions and

with varying supply voltages by commutating a timing capacitor of the multivibrator between matched current source charging circuits. A gating circuit is coupled to the junctions of the timing capacitor with the current sources and supplies an output to a comparator circuit which provides the output pulses from the multivibrator. An astable or free running multivibrator also can be formed with the addition of a bistable circuit to the basic circuit.

3,725,682

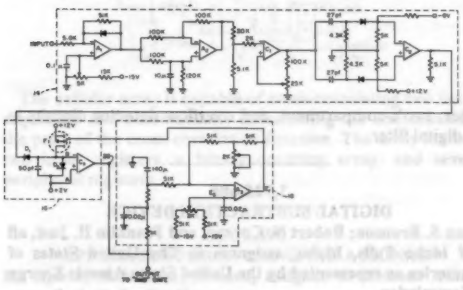
ONE SHOT MULTIVIBRATOR FOR VARIABLE WIDTH VIDEO EDGE DETECTOR

David Rubin, Riverside, Calif., and John B. Seybold, Corona, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Division of Ser. No. 865,709, Oct. 13, 1969. This application April 14, 1971, Ser. No. 134,064

Int. Cl. H03k 17/00

U.S. Cl. 307—273 **2 Claims**



A device, used with an analog video correlation, for edge detecting the video input from two TV cameras to immediately discern the time correlations peak from past or future partial correlation peaks providing dependable real time map matching.

3,725,683

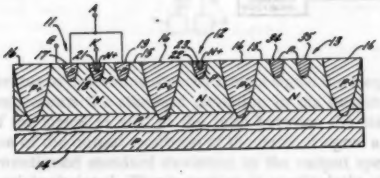
DISCRETE AND INTEGRATED-TYPE CIRCUIT

Todd G. Andersen, Lombard, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Feb. 3, 1971, Ser. No. 112,345

Int. Cl. H01l 17/00

U.S. Cl. 307—305 **18 Claims**



A three terminal, four layer latching-type thyristor having its gate brought out from the layer or region adjacent its anode is characterized by having a holding current level which is substantially higher than its turn-on current level and is, therefore, especially well suited for end mark controlled switching systems.

3,725,684

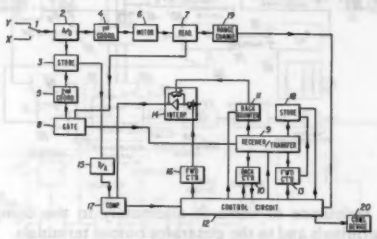
DIGITAL/ANALOG LINEAR INTERPOLATOR

Rudolf K. H. Panschow, Wunstorfer Strasse 59, Hannover, Germany

Continuation-in-part of Ser. No. 718,814, April 4, 1968, abandoned. This application Nov. 13, 1970, Ser. No. 89,424

Int. Cl. G06f 7/38; G06j 1/00

U.S. Cl. 235—152 **16 Claims**



An electronic calculating machine for determination of a desired output quantity $z(x_e, y_e)$ related to a first input quantity x_e variable within limits x_o to x_m and to a second input quantity y_e variable within limits y_o to y_m. The machine includes a first store storing permanently for each individual one of a series of fixed values x_o to x_m of the first input quantity the output quantities $z(x, y)$ for a series of fixed values y_o to y_m of the second input quantity. A reading device is provided for reading out from the first store the output quantities $z(x_\nu, y_\mu)$, $z(x_{\nu+1}, y_\mu)$, $z(x_\nu, y_{\mu+1})$ and $z(x_{\nu+1}, y_{\mu+1})$. An interpolation device is provided for forming, according to one of two preselected linear interpolation functions, as a first interpolated value one of the values $z(x_\nu, y_e)$ and $z(x_e, y_\mu)$ by linear interpolation between the two output quantities of one of the both pairs of output quantities $z(x_\nu, y_\mu)$ and $z(x_\nu, y_{\mu+1})$ and $z(x_\nu, y_\mu)$, $z(x_{\nu+1}, y_\mu)$, and as second interpolated value one of the both values $z(x_{\nu+1}, y_e)$ and $z(x_e, y_{\mu+1})$ by linear interpolation between one of the both pairs of output quantities $z(x_{\nu+1}, y_\mu)$, $z(x_{\nu+1}, y_{\mu+1})$ and $z(x_\nu, y_{\mu+1})$, $z(x_{\nu+1}, y_{\mu+1})$ and in conjunction a third interpolated value $z(x_e, y_e)$ by linear interpolation between the first and second interpolated values. Means are provided for giving out the third interpolated value as the desired output quantity. The calculating machine forms sums and differences in a digital manner and products and quotients in an analog manner.

3,725,685

SYSTEM FOR ADJUSTING THE VALUE OF A RESISTANCE TO A PREDETERMINED VALUE

Gerard Bourgoin, 93 Romainville; Pierre Kumurdjian, 91 Saint-Cheron; Alain Loitiere, 91 Wissous, and Jean-Francois Pere, 94 Ivry, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

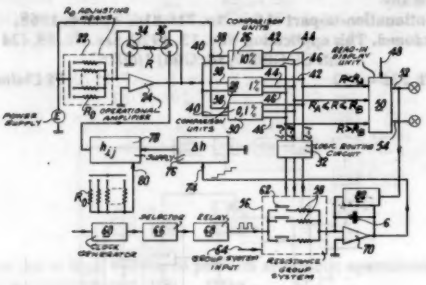
Filed May 25, 1971, Ser. No. 146,634

Int. Cl. G06g 7/48

U.S. Cl. 235—151.1 **7 Claims**

The value R of a resistance is adjusted to a predetermined value R_p, R being modified by oxidation of the resistance by the flow therethrough of an electrical pulse train, by at least two read-in circuits, one for reading-in the value R_p and the other for reading-in the required accuracy of the value R. A comparator having two inputs, one of the inputs having two terminals is connected across the resistance while the other input is connected to the read-in circuit for the value R_p. The comparator compares R and R_p. A store and control circuit whose input is connected to the comparator output determines the power of the first electrical pulse and the power increment of the pulses, the pulse power possibly being initially zero. A generator produces the pulses and the generator input is connected to the store and control circuit output. The generator output may be connected to at least one of the two ends of the resistance of value R. A clock circuit is connected

to the generator and selects the repetition frequency and the average width of the pulses. A selector connects the terminals



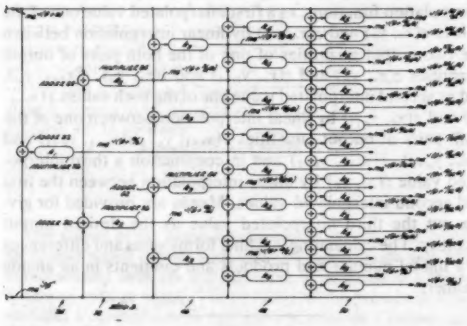
of the resistance of value R alternately to the comparator input terminals and to the generator output terminals.

3,725,686

POLYPHASOR GENERATION BY VECTOR ADDITION AND SCALAR MULTIPLICATION

Gerald S. Ustach, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 29, 1971, Ser. No. 110,956
Int. Cl. G06f 7/38; G06g 7/22
U.S. Cl. 235—156 **13 Claims**



Herein is disclosed the method and apparatus for producing angular rotations of an input signal (phasor). The method involves phase shifting the input signal by a preselected amount, vectorially adding the input and the phase shifted signals, and then adjusting the amplitude of the sum phasor by a scalar multiplication operation. The addition and multiplication steps are repeated in a plurality of subsequent processing operations whereby various combinations of phasor signals produced during preceding steps are summed and amplitude adjusted to obtain a set of output signals having preselected phase values.

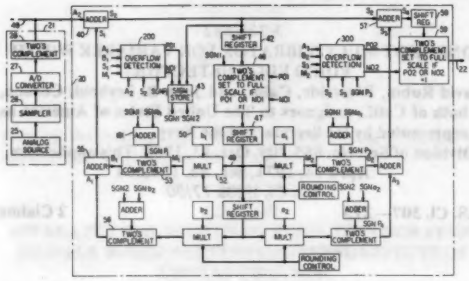
3,725,687

THRESHOLD LOGIC DIGITAL FILTER

John Donnell Heightley, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed March 4, 1971, Ser. No. 120,829
Int. Cl. G06f 7/38
U.S. Cl. 235—164 **8 Claims**

A threshold logic digital filter converts an input sequence of sets of bits representing amplitudes of a continuous signal at predetermined sample times into another sequence of sets of bits representing the input sequence of sets transformed by a predetermined difference equation. Storage-processor elements are used for implementing threshold logic adder, multiplier, two's-compartment, and overflow detector circuits in the digital filter.

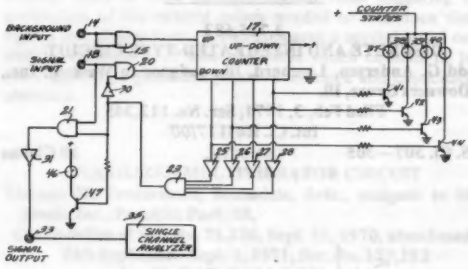


3,725,688

DIGITAL SUBTRACTION DEVICE

Glenn S. Brunson; Robert N. Curran, and Franklin H. Just, all of Idaho Falls, Idaho, assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 3, 1971, Ser. No. 177,599
Int. Cl. G06f 7/385, 7/38
U.S. Cl. 235—176 **3 Claims**



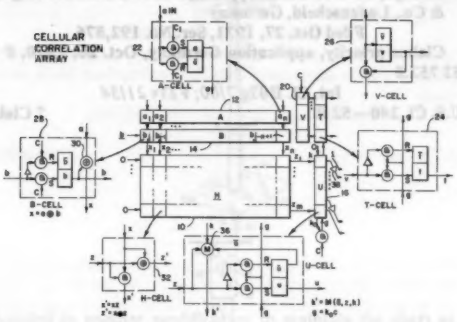
This circuit acts to subtract a first series of pulses from a second series of pulses. The second series of pulses is coupled directly to an output terminal of the circuit until a first series pulse is counted in one direction by an up-down counter. With a count greater than zero in the up-down counter, the second series of pulses is coupled thereto to count in the opposite direction. With the up-down counter having a count greater than zero, the second series of pulses are also blocked from the output terminal of the subtraction device.

3,725,689

CELLULAR CORRELATION ARRAY

William H. Kautz, Woodside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 3, 1971, Ser. No. 168,654
Int. Cl. G06g 7/19
U.S. Cl. 235—181 7 Claims



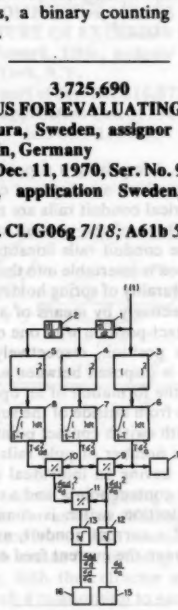
The cellular array is capable of cross-correlating two binary sequences and automatically determining the coordinates of the peak of the cross-correlation function. The array includes two input registers, a binary counting array, and several peripheral registers.

3,725,690

APPARATUS FOR EVALUATING A SIGNAL

Bo Hjorth, Sollentura, Sweden, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Dec. 11, 1970, Ser. No. 97,229
Claims priority, application Sweden, Dec. 11, 1969, 17159/69
Int. Cl. G06g 7/18; A61b 5/04
U.S. Cl. 235—183 1 Claim



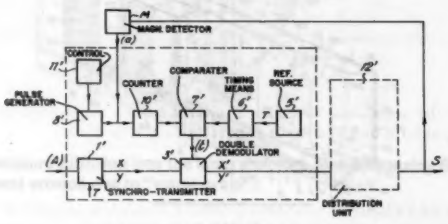
Apparatus to determine directly from a signal the frequency which represents the standard deviation in the output spectrum of the signal as well as the ratio between the standard deviation of the output spectrum of the derived signal and the above-mentioned standard deviation in the output spectrum of the original signal. The invention is particularly characterized in that the standard deviation or variance of the derived signal is divided by the standard deviation or variance of the original signal, and in that the standard deviation or variance of the twice derived signal is divided by the standard deviation or variance of the single derived signal, whereupon the quotient produced by this procedure is divided by the quotient (standard deviation frequency) produced by the first-mentioned procedure.

3,725,691

ELECTRONIC DEVICES FOR FORMING ALGEBRAIC SUMS

Jacques Delaunay, St-Remy-Les-Chevreuses, France, assignor to Societe De Fabrication D'Instruments De Mesure SFIM, Ramolfo-Garnier, France

Filed July 16, 1971, Ser. No. 163,263
Claims priority, application France, July 17, 1970, 7026471
Int. Cl. G01c 17/38; G06g 7/22
U.S. Cl. 235—186 12 Claims



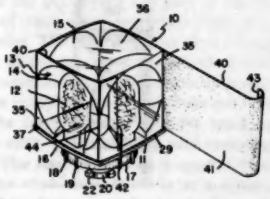
An electronic device is arranged to correct the angle A of gyroscopic heading for variations in the magnetic deviation angle a, thereby producing the angle $(A+a)$. A synchro transmitter generates a sin A and a cos A signal which are subsequently modulated by a modulator. The modulated signals are then integrated between two sets of limits each of which is a function of the angle a and the operational frequency of the modulator. The relationship between the angle a and operational frequency is such as to provide four output signals respectively representing various combinations of the product between different pairs of the functions sin A, cos A, sin a and cos a. By appropriate summing in accordance with trigonametric equations, signals of sin $(A+a)$ and cos $(A+a)$ can be produced.

3,725,692

PHOTOGRAPHIC FLASHLAMP UNIT

Charles H. Miller; David R. Broadt, and Donald E. Armstrong, all of Williamsport, Pa., assignors to GTE Sylvania Incorporated

Filed Dec. 20, 1971, Ser. No. 209,962
Int. Cl. G03b 15/02
U.S. Cl. 240—1.3 10 Claims



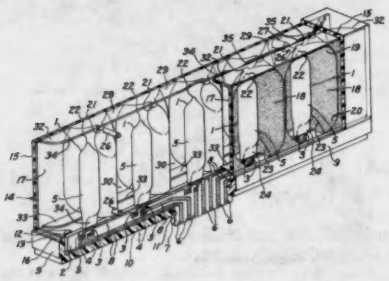
A flash cube having a strip of adhesive-backed transparent plastic tape wrapped about its transparent cover side walls to provide increased containment capability.

3,725,693

LINEAR PHOTOFLASH LAMP ARRAY AND REFLECTOR UNIT THEREFOR

Robert M. Anderson, Pepper Pike; James M. Hanson, Cleveland; Richard C. Lecrone, Euclid, and William B. Landgraf, Cleveland Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed March 31, 1972, Ser. No. 239,917
Int. Cl. G03b 15/02
U.S. Cl. 240—1.3 17 Claims



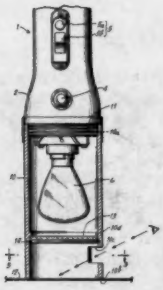
A two-sided linear photoflash lamp array having a multiple reflector unit comprised of a pair of complementary strip-like thin-walled molded plastic reflector panels each formed with a row of side-by-side lamp reflectors and mounted back-to-back in aligned relation with their reflectors facing outwardly in opposite directions and located in staggered nested relation. The reflector panels have interfit members and abutting stand-off shoulders on their backsides for locating the two panels in properly aligned back-to-back position with their reflectors in staggered nested relation and spaced a predetermined distance apart. Stiffening flanges extending between and integrally joining adjacent reflectors of each reflector panel rigidify the panel and prevent heat distortion of any reflector thereof by the flashing of the photoflash lamps in next adjacent reflectors.

3,725,694

PORTABLE LAMP FOR VIEWING FLUORESCENT MATERIAL

Salvatore F. D'Amato, Flora Park, N.Y.; Clifford D. Guertin, River Vale, and Oliver Lednicer, Hackensack, both of N.J., assignors to American Bank Note Company, New York, N.Y.

Filed April 5, 1971, Ser. No. 131,105
Int. Cl. F21v 33/00
U.S. Cl. 240—6.4 R 3 Claims



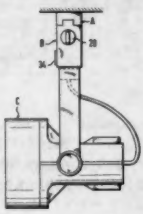
Portable lamp, such as a flashlight, for viewing printed material having fluorescent, normally invisible markings thereon, comprising a flashlight having an ultraviolet lamp, and an opaque hood around the lamp and projecting beyond the lamp. The end of the hood is opened and is adapted to be placed against a printed document to be viewed. An aperture is provided in the side of the hood through which the document may be viewed while it is held against the end of the hood.

3,725,695

ILLUMINATION DEVICE

Gerhard Eversberg, Ludenscheid, and Heinz Seelbach, Kierspe, both of Germany, assignors to Firma Reininghaus & Co., Ludenscheid, Germany

Filed Oct. 27, 1971, Ser. No. 192,876
Claims priority, application Germany, Oct. 28, 1970, P 20 52 752.0
Int. Cl. H02g 7/00; F21v 21/34
U.S. Cl. 240—52 R 7 Claims



A lighting device, comprising a supporting rail defining a receiving channel in which are disposed conduit rail carriers. A plurality of electrical conduit rails are received in the conduit rail carriers. Three of the conduit rails constitute pole rails and one of the conduit rails constitutes a zero-conduit rail. A connection box is insertable into the supporting rail and is equipped with a plurality of spring holding- and contact-tongues switchable selectively by means of a switch into an engagement- and contact-position with one of the pole rails and into an inoperative position, respectively. An independent preselection switch is disposed between each individual pole contact tongue for the formation of an operating current circuit, and switchable from outside of the supporting rail, and is further equipped with switch contact points of a number corresponding with the number of pole rails on the side of the supporting rail and having an individual contact connection with one of the pole contact points, and a switch bridge on the inside of the preselection switch is connected with a light source by means of a current conduit, and the light source being disposed between the current feed on the pole side and the zero conduit.

3,725,696

PORTABLE LIGHT HOLDER FOR CAMPER'S GAS LAMP

Allen Russell Morton, 1425 Brookline Avenue, Plymouth, Mich.

Filed Oct. 19, 1970, Ser. No. 81,766
Int. Cl. F21v 21/00
U.S. Cl. 240—84 11 Claims

A camp light holder including a telescoping shaft, structure including a substantially flat member extending transversely of the shaft at the bottom thereof and at least one elongated sharpened member for securing the shaft in an upright position on the ground, bail means removably secured to the top of the shaft for supporting a camper's gas lamp and reflecting means operably associated with the bail means for directing the light from the gas lamp. A clamp is provided in one modification of

the light holder for maintaining the telescoping shaft at a predetermined height, while an axially split wedging collar is

provided in another modification to maintain the shaft at a desired height.

3,725,697

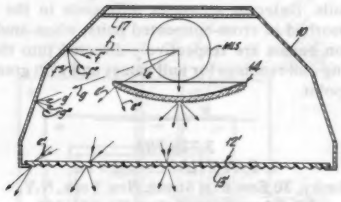
LUMINAIRE COMPRISING MEANS FOR REDUCING TEMPERATURE OF EXTERIOR REFRACTOR

Vearl S. Wince, Newark, Ohio, assignor to Holophane Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 816,873, March 19, 1969, abandoned. This application Oct. 3, 1969, Ser. No. 871,513

Int. Cl. F21v *13/04*

U.S. Cl. 240—93 **9 Claims**



A luminaire for indoor area lighting is provided with an intermediate member for at least diffusing and optionally distributing light emitted from a high intensity light source onto a prismatic lens, with means for diffusing light reflected by the luminaire housing, with the refractor and the intermediate member having such a relationship to each other that the efficiency of the luminaire will be increased and the temperature of the exterior refractor is minimized permitting fabrication thereof from plastic.

3,725,698

MOISTURE BARRIER FOR SEALED BEAM HEADLAMP CONSTRUCTION

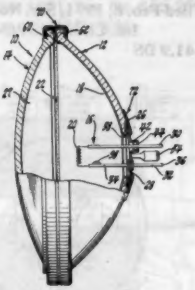
Gale M. Craig, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed March 2, 1971, Ser. No. 120,087

Int. Cl. F21m

U.S. Cl. 240—41 SB **4 Claims**

A sealed beam headlamp wherein the mating areas between component parts are structurally and hermetically joined by a plastic cement overlaid by a metallic moisture barrier, the latter establishing a tortuous moisture flow path of minimal cross section through the cement thereby reducing the rate of moisture diffusion into the lamp envelope and minimizing filament erosion due to "water cycle".



3,725,699

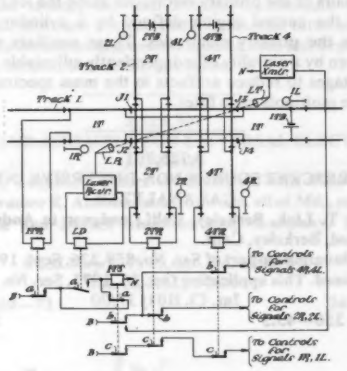
TRAIN DETECTION SYSTEM FOR RAILROAD GRADE CROSSING

Frank T. Pascoe, Greentree Borough, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jan. 19, 1971, Ser. No. 107,656

Int. Cl. B61l *23/00*

U.S. Cl. 246—114 **8 Claims**

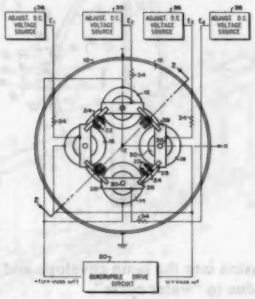


Laser beam presence detection apparatus is positioned to detect a railroad car occupying any part of the crossing portion of a stretch of track which intersects other tracks in a railroad grade crossing. The laser detector thus checks the occupancy condition of the track portion which is insulated from the adjacent conventional track circuit on each side but is long enough to hold a complete car which does not then shunt the track circuit. The laser detector and the track circuit relay jointly control a stick relay normally held energized solely by the track relay. The laser apparatus is approach energized by the release of the stick relay when a train initially occupies either part of the adjacent track circuit. The stick relay is reenergized only when the track relay and the laser detector each record a non-occupied condition for the corresponding section of the crossing track. The stick relay controls the entering signal circuits for all possible conflicting routes through the crossing area but simultaneous parallel moves are permitted.

3,725,700
MULTIPOLE MASS FILTER WITH ARTIFACT-REDUCING ELECTRODE STRUCTURE

Wilson R. Turner, Los Gatos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 8, 1971, Ser. No. 113,312
Int. Cl. H01j 39/34
U.S. Cl. 250—41.9 DS 12 Claims

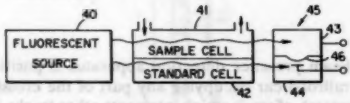


Parallel primary electrodes are symmetrically disposed about a central axis within an electrically conductive housing operated at a reference potential. These primary electrodes are driven by an excitation voltage comprising A.C. and D.C. components balanced with respect to the reference potential to provide a multipole mass filter. An ion source is positioned adjacent to the entrance end of the multipole mass filter for transmitting ions generally along the central axis to an ion detector positioned adjacent to the exit end of the multipole mass filter. Auxiliary electrodes, at least some of which may be operated at different potentials, are disposed between adjacent pairs of the primary electrodes along the length thereof outside the central region defined by a cylinder inscribed between the primary electrodes. These auxiliary electrodes are driven by a plurality of independently adjustable D.C. control voltages to reduce artifacts in the mass spectra obtained from the multipole mass filter.

3,725,701
FLUORESCENT SOURCE NON-DISPERSIVE INFRARED GAS ANALYZER

William T. Link, Berkeley, Calif., assignor to Andros Incorporated, Berkeley, Calif.

Continuation-in-part of Ser. No. 859,326, Sept. 19, 1969, abandoned. This application Oct. 26, 1971, Ser. No. 192,602
Int. Cl. H01j 37/00
U.S. Cl. 250—43.5 27 Claims

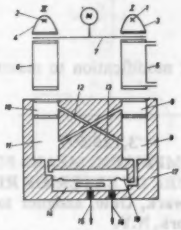


A non-dispersive infrared gas analyzer utilizing a fluorescent source including a specific gaseous compound whose presence in an unknown gas mixture is to be detected and a container having infrared transparent portions. Fluorescent emission from the specific gaseous compound is stimulated by, for example, a black body infrared source. A sample cell retains an unknown gas mixture in a position to receive fluorescent emission so stimulated while a suitable detector or transducer detects energy absorption by the unknown gas mixture of substantially any portion of the fluorescent emission spectrum of the gaseous compound being detected. An additional stage of selectivity is obtained by inserting a fluorescent filter between the sample cell and the detector. A standard for comparison is provided by a two-channel gas analyzer utilizing a standard cell or normalizing cell in addition to the sample cell. A standard for comparison is also provided by including in the fluorescent source a gaseous compound and enriched quantities of one or more isotopes of the gaseous compound to provide different but nearby wave lengths. A variety of arrangements for signal chopping and for shielding the black body infrared source from the sample cell is included.

3,725,702
INFRARED GAS ANALYZER

Werner Schaefer, Oberhochstadt, Germany, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 29, 1969, Ser. No. 795,089
Int. Cl. G01n 21/34
U.S. Cl. 250—43.5 R 5 Claims

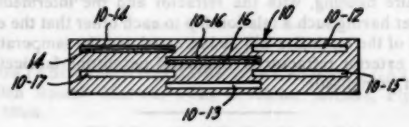


Detector for analyzer is made up of four gas chambers, an incident pair and a respectively alined pair directly after the incident pair, chambers of the pairs being cross-connected by gas conduits. Detector measures difference in the sums of energy absorbed in cross-connected pairs, when analysis and comparison beams are respectively directed into the alined pairs, giving null readings for null values and with great stability of null point.

3,725,703
X-RAY FILM CASSETTE

Peter A. Bucky, 30 East 81st Street, New York, N.Y.

Filed June 9, 1971, Ser. No. 151,306
Int. Cl. G03b 41/16
U.S. Cl. 250—65 R 6 Claims



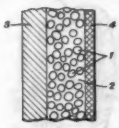
A cassette for holding a plurality of X-ray film packs. The film packs are held in overlapping positions so that the edges of adjacent internal films are aligned to make up a large overall continuous area. Lead markings on the cassette cause mating symbols to be imaged on adjacent films; the final photographs can thus be pieced together easily to form the composite larger picture.

3,725,704

RARE EARTH PHOSPHORS FOR X-RAY CONVERSION SCREENS

Robert A. Buchanan, Palo Alto, Calif.; Melvin Tecotzky, Mendham, N.J., and Kenneth A. Wickersheim, Palo Alto, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 28, 1971, Ser. No. 110,442
Int. Cl. G01t 1/20
U.S. Cl. 250—71 R 8 Claims



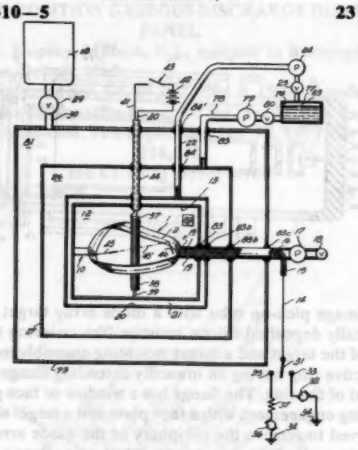
This invention relates to phosphor screens for converting x-rays to visible or near visible radiation and phosphor materials used in such screens. More particularly, the x-ray conversion screens are of the type used, for example, in fluoroscopy, film intensifiers and x-ray image intensifier tubes and the phosphor materials are oxysulfides of lanthanum, gadolinium or lutetium activated with trivalent terbium.

3,725,705

METHOD FOR STORING ELECTRIC ENERGY AND AN ELECTRIC ENERGY STORING SYSTEM

Adolfo Samuel Werner Borinski, Casilla de Correo, 4836-Correo Central, Buenos Aires, Argentina

Filed Feb. 2, 1972, Ser. No. 222,950
Int. Cl. H02n 1/00
U.S. Cl. 310—5 23 Claims



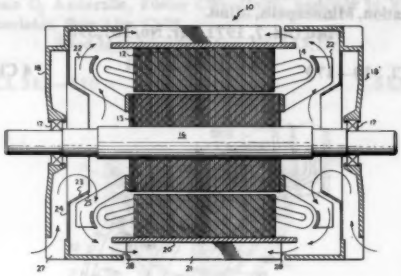
Method for storing electric energy and an electric energy storing system for directly storing extremely high density electric charges, comprising a metallic conductor defining an endless non-orientable surface, preferably housed and insulatingly suspended in a refrigerated chamber, cooled below the transition point of said conductor, an insulated electricity conducting line connected at one point to said conductor and accessible from outside of said chamber, and means for at least temporarily creating an impelling force on the electrons of static electric charges to be fed over said line onto said conductor, to provide a direction controlled movement of electrons along said conductor.

3,725,706

HEAT TRANSFER SYSTEM FOR DYNAMOELECTRIC MACHINE

Alan Franck Lukens, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 26, 1971, Ser. No. 165,950
Int. Cl. H02k 9/06
U.S. Cl. 310—62 3 Claims



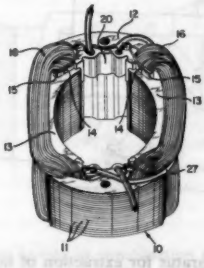
A dripproof dynamoelectric machine is described wherein air is admitted through the end shields directly into the end turn cavities at opposite ends of the machine to be circulated across the radially inner faces of the end turns before being expelled from the end of the machine whereat the air was admitted. The exhaust air then is directed across the motor frame by a shroud overlying the exhaust apertures to cool the stator by the transfer of heat from the stator laminations through the frame to the air circulating across the frame. Preferably the frame is finned to maximize the heat transfer surface in contact with the flowing air and the fans are secured to the rotor end rings. For increased volumetric flow of the air through the motor, the fans utilized to circulate the air through the end turn cavities underly the end turns adjacent the stator laminations and extend radially outward beyond the stator end turns to overlie the end turns.

3,725,707

FIELD SUB-ASSEMBLY FOR UNIVERSAL ELECTRIC MOTORS

Wendell B. Leimbach, James W. Marshall, both of Baltimore, and Salvatore R. Abbratozzato, Towson, all of Md., assignors to Black and Decker Manufacturing Company, Towson, Md.

Filed May 5, 1971, Ser. No. 140,374
Int. Cl. H02k 11/00
U.S. Cl. 310—71 24 Claims



For a universal electric motor, a wound field sub-assembly including a core and a pair of coils wound in slots therein, wherein the solid, magnet wire of the coils is connected to the stranded, lead wire via a simplified and improved connector and process. A connector, insulatively mounted on the field core, receives the magnet wire and provides for later connection to stranded lead wire or another circuit element.

The process includes, in addition to the conventional winding of the coils on the core, the step of mechanically securing the start and end portions of the wound coil to the terminal before control thereof is released by the winding apparatus.

3,725,708

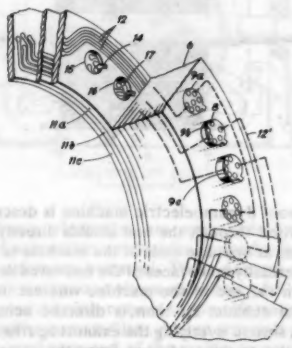
CORE FOR A DYNAMO-ELECTRIC MACHINE

Zinon C. Possis, Minneapolis, Minn., assignor to Possis Corporation, Minneapolis, Minn.

Filed Oct. 7, 1971, Ser. No. 187,398

Int. Cl. H02k *3/00*

U.S. Cl. 310—179 **4 Claims**



Stators and armatures for dynamo electric machines in which the customary windings are replaced by extruded inserts seated in circumferentially spaced holes that extend axially through the core of the stator or armature, each of which inserts consists of a group of parallel spaced apart wires embedded in insulating material, the ends of the wires being connected to conductivity paths of printed circuit boards at the axially opposite faces of the core.

3,725,709

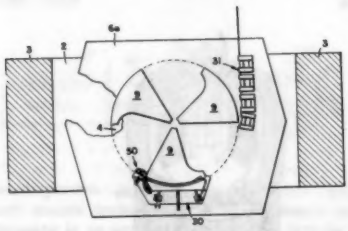
CYCLOTRON BEAM EXTRACTION

George O. Hendry, Napa, Calif., and Dale K. Wells, Martinez, both of Calif., assignors to The Cyclotron Corporation, Berkeley, Calif.

Filed Feb. 25, 1971, Ser. No. 118,751

Int. Cl. H05h *13/00*

U.S. Cl. 313—62 **6 Claims**



A method and apparatus for extraction of high beam currents from an isochronous cyclotron which segregates that portion of the orbiting particles to be extracted at the extraction radius in the absence of any electric deflection field and then electrostatically deflects the segregated particles from orbit with an electrostatic field the location of which increases in radius with respect to the center of the cyclotron. Segregation is made by a long sloped and cooled preseptum preceding an electrostatic deflection channel.

3,725,710

METHOD OF MAKING A CATHODE-RAY TUBE

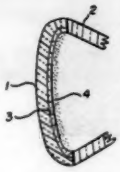
Johannes De Gier, and Reinhart Charles Willem Elsses, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 542,967, April 7, 1965, Pat. No. 3,573,955. This application Feb. 25, 1971, Ser. No. 118,761

Claims priority, application Netherlands, April 17, 1965, 6504936

Int. Cl. H01j *29/00, 29/22*

U.S. Cl. 313—64 **6 Claims**



Discoloration of easily reducible oxide containing glass in window portion of cathode-ray tube due to high energy electron bombardment is prevented by providing a thin transparent layer substantially free of easily reducible metal ions between the glass and the superimposed luminescent screen.

3,725,711

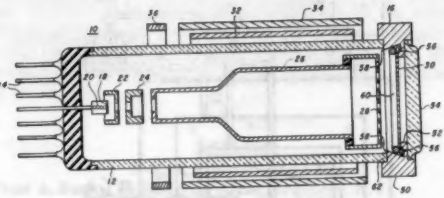
IMAGE PICK-UP TUBE SUPPORT STRUCTURE FOR SEMICONDUCTIVE TARGET

Porter Sadler, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 1, 1971, Ser. No. 148,762

Int. Cl. H01j *29/02, 31/38, 29/45*

U.S. Cl. 313—66 **6 Claims**

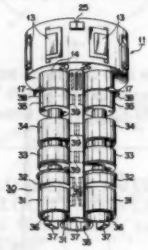


An image pick-up tube with a diode array target having a chemically deposited silicon resistive film covering the diode array of the target and a target mounting assembly including a conductive ring having an inwardly extending flange adjacent one end of the ring. The flange has a window or face plate side in sealing engagement with a face plate and a target side which is grooved to receive the periphery of the diode array target. The inner wall of the ring coacts with the ring flange to form a notch for a spring type retaining ring. The retaining ring when properly positioned within the notch directs the periphery of the diode array target into the groove and retains the target firmly within the groove of the conductive ring. The target bearing side of the flange is channeled to prevent air entrapment between the target and face plate when vacuumizing the image pick-up tube. The end of the ring opposite the face plate surface forms a seat for the bulb of the image pick-up tube and a stop for a retaining ring positioning tool. The stop properly positions the target retaining ring when carried by the tool and prevents the retaining ring from contacting the fragile diode array target. When assembled with the target the conductive ring provides the electrical contact for biasing the target and taking off the video signal.

3,725,712
TRIPLE ELECTRON GUN ASSEMBLY HAVING UNITS ATTACHED BY GLASS BEADS TO PROTRUSION FROM CONVERGENCE ELECTRODE

Shinichi Sawagata, Nerima-ku, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 29, 1971, Ser. No. 184,776
Claims priority, application Japan, Oct. 20, 1970, 45/103549
Int. Cl. H01j 29/02, 29/50
U.S. Cl. 313—70 C 5 Claims

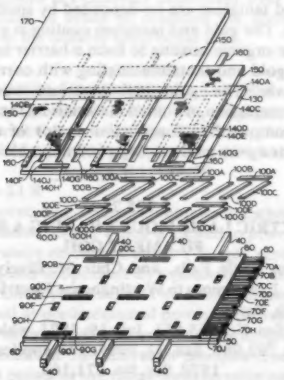


A triple electron gun assembly comprising three stacks of electrodes so arranged as to have their axes slightly inclined for convergence and a cup-shaped convergence electrode secured to the forward ends of the three electron gun units, said cup-shaped convergence electrode being provided with a protrusion having cylindrical walls corresponding in size and shape to the forward ends of the three electron gun units.

3,725,713
MULTI-POSITION GASEOUS DISCHARGE DISPLAY PANEL

George A. Kupsky, Milford, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 88,047, Nov. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 61,642, Aug. 6, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,538
Int. Cl. H01j 61/38, 61/66
U.S. Cl. 313—108 R 15 Claims

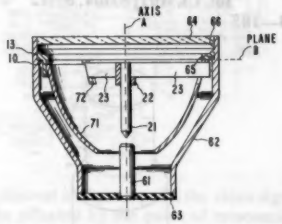


The display device is of a sandwich construction and includes a base plate on which a plurality of the electrode components of the device are formed by a screening or printing process or the like. The base plate may also include a sheet of metal having an insulating coating, the metal sheet having preformed portions which can be used to support electrode contacts after the entire device has been assembled.

3,725,714
MOUNTING RING AND METHOD FOR REFERENCING MEMBERS IN A SHORT ARC LAMP

Norman C. Anderson, Foster City, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed May 13, 1971, Ser. No. 143,165
Int. Cl. H01j 17/06
U.S. Cl. 313—110 5 Claims

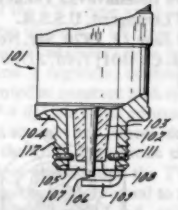


A mounting ring and method is described for referencing the cathode to the reflector in a short arc lamp, and the cathode/reflector to the anode and the lamp exterior. A reference plane is formed on the mounting ring. One or more planes parallel to this reference plane are formed in a brazing fixture and spaced so that the tip of the cathode is at a controlled distance from the reference plane. The same reference plane or one parallel to it is used to control positioning of the anode and lamp exterior. Axial concentric surfaces are formed on the ring and on at least one cylinder in the brazing fixture to control concentricity of the ring, cathode and reflector, and of the ring, anode and lamp exterior. When two or more cylinders are used, surfaces on a first cylinder can be made to expand at the same rate as the ring, with one surface constrained at brazing temperature by a concentric surface on a second cylinder which expands at substantially the same rate as the electrode.

3,725,715
SPARK PLUG

Cecil J. Krow, P.O. Box 249, Ralston, Okla.

Filed July 19, 1971, Ser. No. 163,825
Int. Cl. H01t 13/42
U.S. Cl. 313—131 10 Claims



A spark plug having in combination an adjustable axial air gap spark and circumferentially interrupted ground electrode means which creates a surface flame spark. The surface flame and air gap spark are transverse to each other, permitting adjustment of the shorter air gap spark electrode. The spark plug comprises a central electrode within an insulator, an air gap surrounding the insulator and a ground electrode carrying a pin which extends over the central electrode. In one embodiment, the air gap is relatively narrow, and carbon-reducing

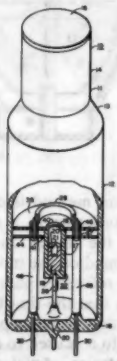
slots are formed in the ground electrode. In a second embodiment, radially adjustable surface flame ground electrode pins are provided. In another embodiment, a non-adjustable pin is carried by the ground electrode for the surface flame. In still another embodiment, a single J-shaped pin acts both as an adjustable air gap spark electrode and an adjustable surface flame electrode.

3,725,716

HOLLOW CATHODE DEVICE WITH IMPROVED SPECTRAL LIGHT OUTPUT AND STABILITY

George K. Yamasaki, Horseheads, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 16, 1971, Ser. No. 153,496
Int. Cl. H01j *61/04, 61/12*
U.S. Cl. 313—185 4 Claims



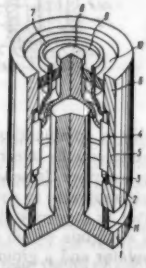
A hollow cathode lamp of the type used as a source of spectral radiation characteristic of the materials within the hollow cathode. More particularly, the cathode is comprised of a body of material of which a characteristic radiation is desired having hollow within a front surface and an electrical conductive sleeve member surrounding said cathode body and extending beyond the front surface of the cathode body and electrically interconnected with the cathode lead-in.

3,725,717

GRID-CONTROLLED MICROWAVE THERMIONIC DEVICE

Anton Felixovich Lellovsky, prospekt Smirnova, 24, korpus 2, kv. 90; Vladimir Alexandrovich Ryabinin, Fontanka, 33, kv. 103; Karl Romanovich Terra, Grazhdansky prospekt, 27, kv. 152, and Kira Boleslavovna Yankevich, ulitsa Shkolnaya, 15, kv. 26, all of Leningrad, U.S.S.R.

Filed June 22, 1970, Ser. No. 48,305
Int. Cl. H01j *1/46, 21/10, 1/15*
U.S. Cl. 313—302 2 Claims



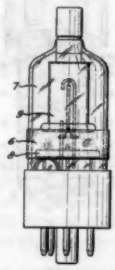
A grid-controlled VHF thermionic device which can be used as an amplifier or a generator of VHF electromagnetic oscillations and which has two grid-leads forming, together with a cathode lead, two lines for feeding in the energy of a VHF electromagnetic field, the two lines being connected in parallel for the currents and voltages of said electromagnetic field.

3,725,718

FLAME-SPRAYED FERRITE POWDER X-RAY RADIATION SHIELD

Virgil P. Quirk, and James M. Titlar, both of Saint Marys, Pa., assignors to Stackpole Carbon Company, Saint Marys, Pa.

Filed April 29, 1969, Ser. No. 828,066
Int. Cl. H01j *1/52*
U.S. Cl. 313—313 2 Claims



Ferrite powder is flame sprayed onto a glass or ceramic substrate to form a continuous coating, in which the powder is fused together and to the substrate to form a radiation shield. When the substrate is the glass envelope of a television receiver high voltage rectifier tube, such a shield in the correct location will absorb most of the X-rays that otherwise would be emitted by the tube.

3,725,719

METHOD AND ARITCLE FOR INHIBITING GASEOUS PERMEATION AND CORROSION OF MATERIAL

Martin M. Seldon, and Leo J. Garbini, both of Sunnyvale, Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Nov. 30, 1970, Ser. No. 93,902
Int. Cl. C23c *15/00*
U.S. Cl. 313—317 5 Claims

A method and apparatus for inhibiting gaseous permeation and corrosion of materials is disclosed. Gaseous permeation and corrosion of materials is inhibited by the provision of a coating of gold and tantalum over the surface of the article to be protected. In a preferred method of applying the coating, the gold and tantalum are co-deposited by sputtering to form the coating. The gold and tantalum coating is preferably protected by an organic coating to form a barrier to prevent contact of the gold and tantalum coating with corrosion-producing materials. The gold and tantalum coating reduces hydrogen permeation of coated materials by factors of several thousand compared to a reduction factor of approximately five times for a pure gold coating of comparable thickness.

3,725,720

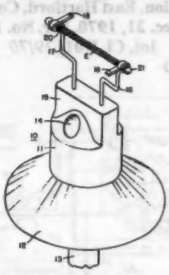
ELECTRIC LAMP MOUNT HAVING A BEADED FILAMENT COIL

James Petro, Little Falls, and Clair M. Rively, Old Bridge, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 163,651, July 19, 1971, which is a division of Ser. No. 792,988, Jan. 22, 1969. This application July 12, 1972, Ser. No. 271,103
Int. Cl. H01j *1/16, 19/10, 19/06*
U.S. Cl. 313—344 6 Claims

The coiled tungstem filament of an electric incandescent lamp is provided with a fused bead of tungsten-iron alloy at each end and is so fastened to the lead wires of the mount as-

sembly that the beads are located outboard from and in contiguous relationship with the respective lead wires. The beads are larger than the diameter of the filament coil and spaced a



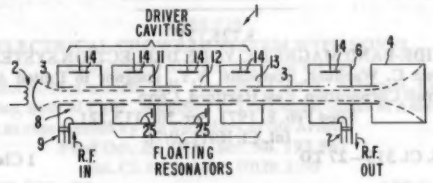
predetermined distance apart and thus serve as built-in guides or "reference points" during the filament-mounting operation which accurately control the lighted-length of the mounted coils.

3,725,721

APPARATUS FOR LOADING CAVITY RESONATOPS OF TUNABLE VELOCITY MODULATION TUBES

Martin E. Levin, San Mateo, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed May 17, 1971, Ser. No. 144,411
Int. Cl. H01j *25/10*
U.S. Cl. 315—5.43 **8 Claims**



A tunable high frequency velocity modulation beam tube has a plurality of floating resonators arranged along a beam path intermediate an input circuit and an output circuit for velocity modulating the beam to provide bunching of the beam at the output circuit. The cavity resonators are tunable over a relatively wide band for tuning the electronic bandwidth of the tube over a relative wide tunable band. A plurality of floating resonators are each loaded by a series resonant loading circuit with the Q's and frequencies adjusted to provide a certain flat electronic bandwidth. The loading circuits are tuned and loaded such that the loss introduced into the floating resonators is frequency dependent over the tunable band of the tube in order to maintain the given electronic bandwidth over the tunable band of the tube.

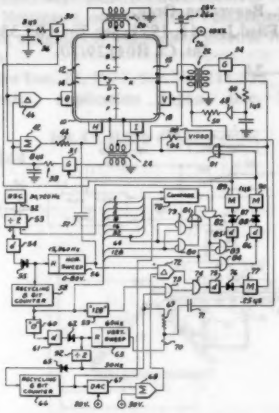
3,725,722

DISPLAY CENTERING SYSTEM

George Mann, Gateshead N.E. 97YA, England, assignor to United Aircraft Corporation, East Hartford, Conn.

Filed April 19, 1971, Ser. No. 134,961
Int. Cl. H01j *29/70*
U.S. Cl. 315—21 R **27 Claims**

A display centering system comprises a cathode ray tube having a metalized screen which is etched to provide at least a pair of electrically discrete sectors. The split screen acts as a target anode; and is operated at a potential to collect all primary and secondary electrons. The beam current is momentarily increased at predetermined points of the raster independently of the normal video signals; and the differential anode currents between the two halves of the split screen are measured at such points of the raster to determine positioning errors. In order to avoid excitation of the phosphors to a visible level, the points in the raster at which the beam current is momentarily increased is successively varied from field to field and from frame to frame. The metalized layer of the screen is preferably split along a line passing through the center of the display so that the display may be centered with the highest accuracy. Information can be readily displayed at the center



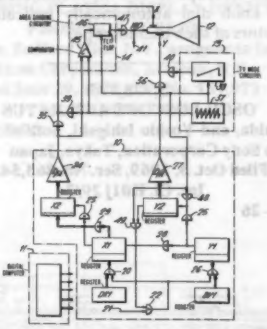
of the screen, since at any given point the video signal will only occasionally be affected by the pulse of increased beam current which is used to establish the center of the display.

3,725,723

GRAPHIC DISPLAY SYSTEM

John Matthew Colston, Gravesend, England, and James Robert Machin, Grand Prairie, Tex., assignors to Elliott Brothers (London) Limited, London, England

Filed Sept. 25, 1970, Ser. No. 76,516
Int. Cl. H01j *29/70*
U.S. Cl. 315—22 **9 Claims**



Display systems of the CRT type are known which operate in various modes. One mode is a TV type mode; another is a DDA (digital differential analyzer) type mode, in which two digital registers (X and Y registers) control the spot displacement, being incremented at constant high speed by increments dx and dy, where $dx^2 + dy^2$ is a small constant. If dx and dy are constant, this draws a straight line, whose slope, $\tan \theta$, is dy/dx.

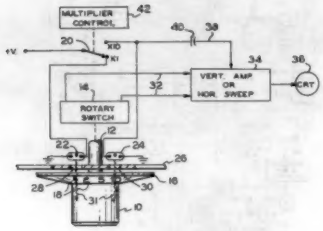
By the invention, the DDA-type mode circuits can also be operated during system operation in the TV-type mode, with dy equal to the line spacing and dx equal to $\tan \theta$ times the line spacing. The X register alone is used, and incremented on each line scan. Its contents are compared with the line scan waveform, and a pulse produced on equality. If this pulse is fed directly to the video circuits, this produces a line on the screen superposed on whatever other information is being displaced. The pulse may instead be used to change the state of a flip-flop whose output is fed to the video circuitry; this results in brightening an area on the screen bounded by the line which the pulses would produce directly. This may be used as a horizon indicator for an aircraft pilot's display system, distinguishing the horizon from any other linear information which may be displayed at the same time.

3,725,724

DEFLECTION FACTOR INDICATING APPARATUS

Charles Howard Vollum, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 11, 1971, Ser. No. 105,336
Int. Cl. H01j 29/70
U.S. Cl. 315—24 **14 Claims**



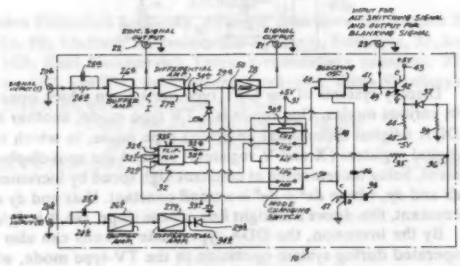
A switch apparatus is described including a rotary switch operated by a knob having a movable dial flange with display characters thereon at switch positions corresponding to different multiplying factors provided for the output signal of an electrical circuit controlled by such switch. A pair of fixed light sources mounted at two different readout positions beneath the flange are selectively energized by an external multiplier switch to illuminate only one of the factors at such readout positions in accordance with the operation of such multiplier switch. The rotary switch and multiplier switch may be connected to change the gain of a vertical amplifier or to change the sweep speed of a horizontal ramp generator in a cathode ray oscilloscope so that the illuminated character display on the knob dial automatically indicates the proper deflection factors of such oscilloscope.

3,725,725

OSCILLOSCOPE APPARATUS

Susumu Yoshida, and Yoshio Ishigaki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 3, 1969, Ser. No. 863,543
Int. Cl. H01j 29/74
U.S. Cl. 315—26 **8 Claims**



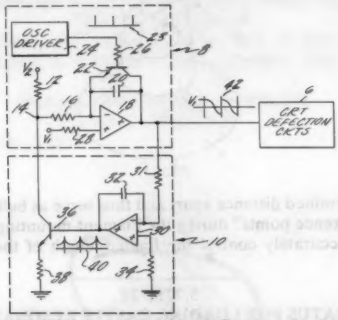
A single-trace type oscilloscope which may be of small size and light weight is adapted for multi-trace operation by providing an adapter connected with the oscilloscope, with minimal alteration of the latter, and which is selectively operable to cause the single-trace type oscilloscope to display a selected one of a plurality of input signals, to display the input signals simultaneously or to display the input signals alternately during successive sweep periods or during successive periods having a high frequency as compared with the sweep frequency.

3,725,726

CRT GEOMETRY CORRECTION WITH ZERO OFFSET

Roger Frankland West, Weston, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 21, 1970, Ser. No. 100,231
Int. Cl. H01j 29/70
U.S. Cl. 315—27 GD **2 Claims**



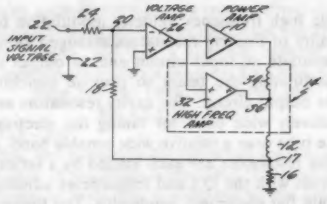
A sawtooth driving voltage for deflecting the beam in a cathode ray tube has centering and geometry distortion correction provided by means of a feedback path including an integrator which adds a substantially parabolic function back to a summing input to the amplifier which is providing the deflection voltage.

3,725,727

WIDE-BAND MAGNETIC YOKE DEFLECTION SYSTEM

Glenn C. Waehner, Scarsdale, N.Y., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 8, 1971, Ser. No. 113,221
Int. Cl. H01j 29/70
U.S. Cl. 315—27 TD **1 Claim**



A system for providing current to an inductive load such as a magnetic yoke deflection system is improved by the addition of a low power, high frequency amplifier and a few passive components. Deflection current components at frequencies higher than the frequency spectrum of the unimproved magnetic yoke deflection system are provided by the high frequency amplifier, thereby enhancing the deflection system bandwidth far beyond limitations encountered using the teachings of the prior art.

3,725,728

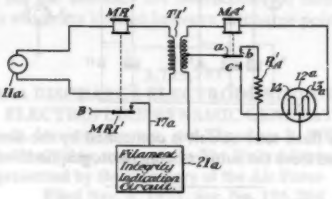
FAIL-SAFE LAMP FILAMENT MONITORING CIRCUIT

Kenneth Gordon King, London, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed Sept. 4, 1970, Ser. No. 69,765
Claims priority, application Great Britain, Sept. 23, 1969, 46,903/69
Int. Cl. H01j 7/44
U.S. Cl. 315—65 **8 Claims**

This invention relates to a fail-safe lamp filament monitoring circuit including an a. c. signal source to provide an a. c. signal to the primary of a transformer which, in turn, supplies alternating electrical energy to a lamp filament connected in its secondary, a monitoring device responsive to the current in

the primary winding and an auxiliary loading device connected in the secondary. The auxiliary loading device is effective to increase power flow through the transformer to energize the filament to a level where the monitoring device is operated and held operated until the lamp filament is no longer energized at which time the monitoring device is released at the transformer magnetizing current.



3,725,729

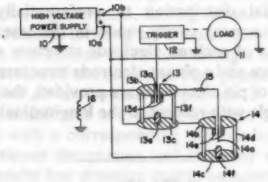
ELECTRICAL CROWBAR SYSTEM WITH NOVEL TRIGGERED SPARK GAP DEVICES

Michael S. McDermott, San Jose, and Carl A. Pederson, Los Altos, both of Calif., assignors to The United States of America as represented by the Secretary of the Army

Filed Oct. 29, 1971, Ser. No. 193,847

Int. Cl. H01t *1/00*; H02h *3/00*

U.S. Cl. 315—75 **4 Claims**



Spark gap devices including removable and adjustable electrodes are shown. These devices are usable in an electrical crowbar circuit. The devices include a master gap device and a slave gap device, each of which includes a tubular insular with metal end caps, and with electrodes attached to the end caps. One of the caps of each device and one of the corresponding electrodes have an axial perforation, with a trigger electrode extending through the perforation. In the master gap device, the trigger electrode extends to the end of the electrode through which it extends; in the slave gap the trigger electrode extends beyond the electrode through which it extends and adjacent the other electrode of the device. All of the electrodes may be easily replaced by disassembling the devices, and may be easily adjusted.

3,725,730

FLICKERLESS THREE-PHASE LIGHTING DEVICE FOR ELECTRIC DISCHARGE LAMPS

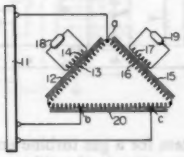
Kenichi Nakai, Neyagawa, and Takehiko Yamashita, Ichikawa, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 23, 1971, Ser. No. 211,510

Claims priority, application Japan, Dec. 28, 1970, 45/130583

Int. Cl. H05b *41/16*

U.S. Cl. 315—144 **4 Claims**



The invention concerns a flickerless discharge lamp lighting device which utilizes a three-phase to two-phase converter capable of converting three-phase current into a two-phase current with a phase difference of 90°.

3,725,731

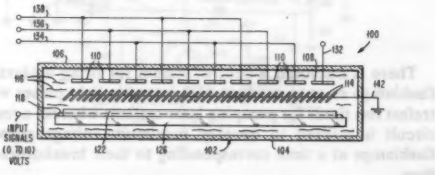
SELF-SCANNING PLASMA DISPLAY DEVICE WITH PHOSPHOR SCREEN

Benjamin Kazan, Bedford Hills, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1971, Ser. No. 157,971

Int. Cl. H05b *39/00*

U.S. Cl. 315—169 R **8 Claims**



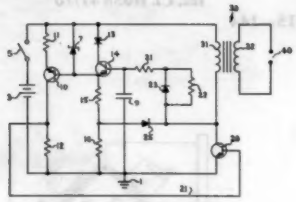
A display device having an inert gas-filled, transparent envelope, containing a set of parallel cathode elements an anode grid structure forming a venetian blind type structure and a glass support plate carrying a set of parallel conducting strips perpendicular to the plane of the parallel cathode strips and coated with a layer of ZnO phosphor. Light is emitted by the phosphor when one of the cathode elements is connected to a negative potential, the anode grid structure connected to a ground potential and one of the phosphor bearing conducting strips is connected to a low positive signal voltage. Color displays may be generated by applying a series of phosphors which generate different colors in an alternating fashion on the glass support plate.

3,725,732

VOLTAGE REGULATED TRANSISTORIZED IGNITION SYSTEM FOR AN AUTOMOBILE TURBINE ENGINE

Kaushik H. Thakore, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 25, 1972, Ser. No. 229,364
Int. Cl. H05b 37/02; F02p 1/00
U.S. Cl. 315—209 T 6 Claims



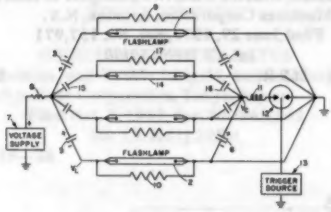
An ignition system for a gas turbine engine that includes a current regulated transistorized oscillator in combination with a transformer and a spark plug in the secondary of the transformer to produce sparks to ignite fuel in the turbine.

3,725,733

ULTRAFAST MULTIPLE FLASHLAMP

Michael E. Mack, Vernon, Conn., and Robert J. Mongeon, East Longmeadow, Mass., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 19, 1971, Ser. No. 135,280
Int. Cl. H05b 37/00
U.S. Cl. 315—228 4 Claims



There is disclosed a control system for firing a plurality of flashlamps so as to produce high intensity light pulses with ultrafast rise times for pumping laser systems wherein a resonant circuit is utilized to develop maximum voltage across the flashlamps at a time corresponding to their breakdown delay time.

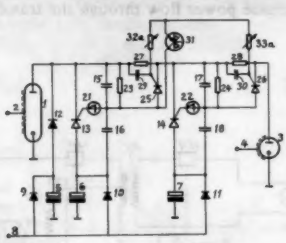
3,725,734

ELECTRONIC FLASH DEVICE

Arthur Schneider, Wiesenweg, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed March 9, 1971, Ser. No. 122,411
Claims priority, application Germany, March 11, 1970, P 20 11 432.3; March 13, 1970, P 20 11 905.5; March 14, 1970, P 20 12 150.0
Int. Cl. H05b 37/00
U.S. Cl. 315—241 P 10 Claims

Electronic flash apparatus for photographic purposes, comprising a flash tube and a series of capacitors providing power for flashing the flash tube. When the flash tube is triggered, only one capacitor is connected across the flash tube. One or more additional capacitors are then switched into the flash tube circuit, for additional flash illumination, depending upon the amount of light required for the photograph. In one embodiment of the invention, the switching of additional capacitors into the flash tube circuit is controlled by the amount of light reflected from the subject being photographed.

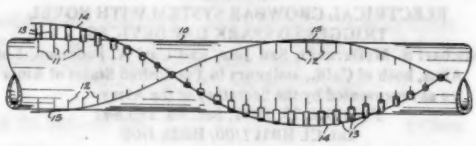


3,725,735

TRANSVERSE ELECTRODE EXCITATION OF A MOLECULAR GAS LASER

Alexandre J. Beaulieu, Ste. Foy; Roger Fortin, Courcelette, Quebec; Derwyn C. Johnson, Ottawa, and Alexander Robinson, Sillery, Quebec, all of Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence of Her Majesty's Canadian Government

Filed Aug. 20, 1970, Ser. No. 65,476
Claims priority, application Canada, Aug. 29, 1969, 60,718
Int. Cl. H01s 3/22; H05b 41/14
U.S. Cl. 315—249 3 Claims



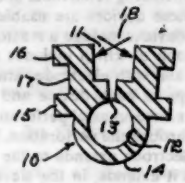
A transverse excitation system for a molecular gas laser is disclosed in which a pair of electrodes supplied with high voltage DC pulses are provided, the electrodes being shaped to cause an electric discharge therebetween which has a predetermined geometric distribution such that the gain characteristic and the refractive index characteristic of the laser is a spatial distribution to preferentially excite a predetermined resonant cavity mode in the laser gas. Two specific examples of such an electrode structure as a helical electrode structure and a planar electrode structure in which a plurality of rows of pin electrodes are provided, the rows being skewed at an angle with respect to the longitudinal axis of the laser.

3,725,736

STATIC NEUTRALIZER

Peter Bishop, Portland, Maine, assignor to United Industrial Syndicate, Inc., Portland, Maine

Filed Feb. 17, 1972, Ser. No. 227,157
Int. Cl. H01t 19/04; H05f 3/00
U.S. Cl. 317—2 F 7 Claims



A device is disclosed for use in neutralizing static electric charges and includes a bar provided with a lengthwise channel

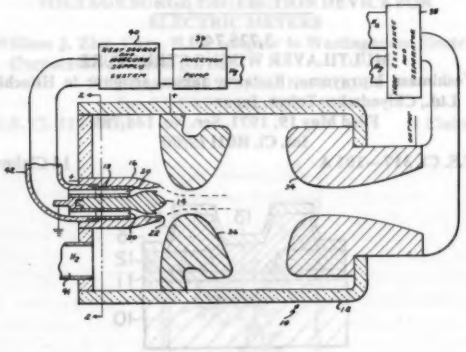
connected to a lengthwise parallel internal passageway by a slit through the intermediate wall with the bar being an extrusion of a material that is yieldably resilient. An insulated conductor has a plurality of discharge devices fixed thereon and is clamped in place with the conductor in the passage and the discharge points of the device extending through the slit into the channel with the walls of the slit in engagement with the discharge points. Grounded conductors are secured to the sides of the bar and they are interconnected through the bar by rivets which are located between discharge points.

3,725,737

CORONA DISCHARGE ELECTRODE STRUCTURE FOR ELECTROFLUID DYNAMIC GENERATOR

Maurice O. Lawson, Dayton, and Theodore L. Willke, Columbus, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 8, 1971, Ser. No. 196,284
Int. Cl. H02k *45/00*
U.S. Cl. 317—3 **5 Claims**



A corona electrode discharge system, such as used in electrofluid dynamic generators, having corona electrode and an attractor electrode forming an annular converging-diverging nozzle, with the corona electrode having a step adjacent the diverging portion of the nozzle. A high pressure fluent material is supplied to the nozzle to provide a supersonic flow through the nozzle and to create a constant density high pressure region with a corresponding high dielectric breakdown strength between the corona and attractor electrodes and a constant density low pressure region adjacent the step with a corresponding low dielectric breakdown strength.

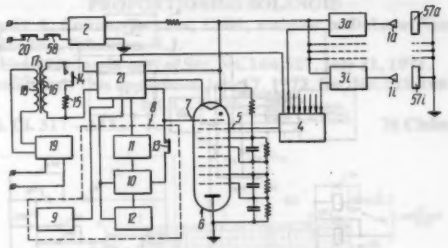
3,725,738

DEVICE FOR PREVENTING A CORONA DISCHARGE FROM ASSUMING THE FORM OF A SPARK DISCHARGE IN ELECTROSTATIC PAINTING APPARATUS

Valery Nikolaevich Sokolsky, Pesochnaya, 2, ulitsa Leningradskaya, 70/2, kv. 8, and Igor Ivanovich Mamaev, Mitavsky pereulock, 3, kv. 26, both of Leningrad, U.S.S.R.

Filed Jan. 28, 1972, Ser. No. 221,709
Claims priority, application U.S.S.R., Dec. 17, 1968, 1291005; Dec. 24, 1969, 1388901
Int. Cl. B05b *5/00*
U.S. Cl. 317—3 **6 Claims**

A protective device preventing the transformation of a corona discharge into a spark discharge in electrical apparatus, particularly, in electrostatic painting apparatus, consists of a multielectrode gas discharge tube having a control grid which through a starting unit is connected to pickups or sensing elements controlling the operating current. The multielectrode gas discharge tube which may be a thyratron has a keep-live electrode. A comparison unit having a source of



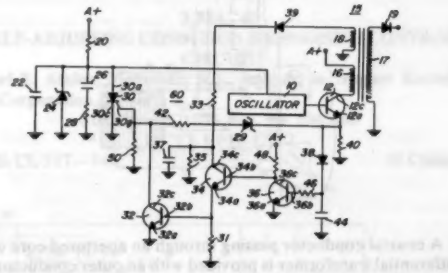
reference voltage is connected through a contact of a time relay to the keep-live electrode.

3,725,739

DUAL MODE POWER SUPPLY PROTECTION CIRCUIT

Donald E. Griffey, Skokie, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 21, 1972, Ser. No. 219,707
Int. Cl. H02h *3/08, 7/20*
U.S. Cl. 317—16 **12 Claims**



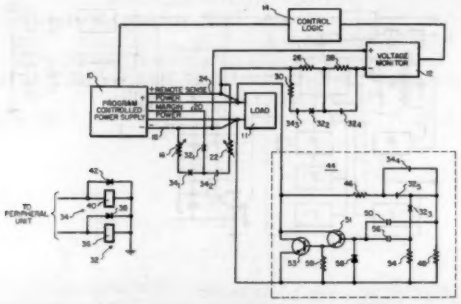
An overload protection circuit for a power supply having circuitry for sensing the amount of current delivered by the supply, and for turning off the supply with a silicon controlled rectifier in the event of an overload. Timing circuitry is provided to automatically turn on the power supply a predetermined time following turn-off, and to sense the current delivered to the load to determine whether the overload still exists. If the overload has been removed, the operation of the power supply returns to normal, but if the overload persists, the power supply is turned off and a second timing circuit maintains the power supply in the off state until the supply is manually reset.

3,725,740

VOLTAGE MARGINING CONTROL CIRCUIT FOR PROGRAM CONTROLLED POWER SUPPLIES

Karl H. Kuster, Glendale Heights, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed March 27, 1972, Ser. No. 238,216
Int. Cl. H02h 9/04
U.S. Cl. 317—16 8 Claims



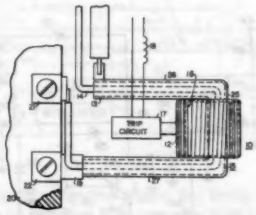
A voltage margining circuit for use with a program controlled power supply wherein relay logic is used to control the output of a monitored power supply during voltage margining of a load during test operations.

3,725,741

DIFFERENTIAL TRANSFORMER MOUNTING ARRANGEMENT PARTICULARY FOR GROUND FAULT INTERRUPTER APPARATUS

John J. Misencik, Shelton, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1971, Ser. No. 158,336
Int. Cl. H02h 1/02; H01f 17/06
U.S. Cl. 317—18 D 5 Claims



A coaxial conductor passing through an apertured core of a differential transformer is provided with an outer conductor in the form of a rigid tubular conductive member with one or more insulated inner conductors therein. Outside the core, the rigid tubular member is bent at two substantially right angles forming two parallel legs. At least an end of one leg is attached to a fixed support so that the coaxial conductor provides a way of fixing the electrical characteristics of the transformer as well as substantially mechanically securing the core of the transformer by a simple and effective means.

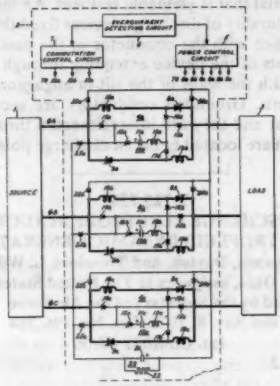
3,725,742

STATIC CIRCUIT BREAKER

Ernest M. Pollard, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Feb. 23, 1972, Ser. No. 228,493
Int. Cl. H02h 7/00
U.S. Cl. 317—33 SC 9 Claims

Disclosed is a 3-phase static circuit breaker including three phase switches, each switch including a pair of power thyristors connected in inverse parallel relationship with one another and a common commutation circuit. A common surge suppressing circuit for all the switches is also provided in the static circuit breaker.

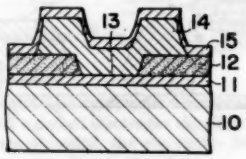


3,725,743

MULTILAYER WIRING STRUCTURE

Yoshimasa Murayama, Kodaira, Japan, assignor to Hitachi, Ltd., Chiyoda-ku, Tokyo, Japan

Filed May 19, 1971, Ser. No. 144,789
Int. Cl. H01l 19/00
U.S. Cl. 317—101 A 14 Claims



A multilayer wiring structure and its method of production, in which the multilayer wiring structure comprises a first wiring conductive layer disposed on the surface of an insulative substrate, an insulative layer disposed on the first wiring conductive layer and provided with an opening for exposing a predetermined part of the conductive layer, an interconnecting conductive layer disposed in the opening part of the insulating layer, the interconnecting conductive layer being thicker than the insulative layer, and a second wiring conductive layer disposed on the insulative layer and the interconnecting conductive layer.

3,725,744

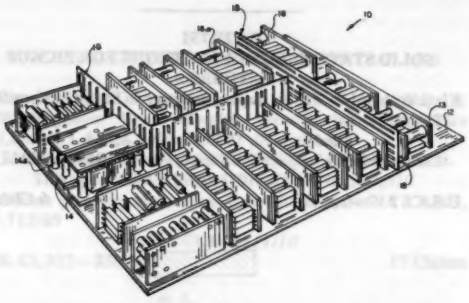
ELECTRICAL COMPONENT CONNECTOR ASSEMBLY

Charles J. Reed, Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Filed June 11, 1971, Ser. No. 156,143
Int. Cl. H05k 1/04
U.S. Cl. 317—101 CC 4 Claims

An assembly for electrically connecting together various miniaturized electrical components is disclosed and generally includes a planer surface, such as a mother board, which supports the electrical components as well as at least one thin insulating strip lying in a plane extending perpendicular to the surface and defining a plurality of apertures arranged in accordance with a predetermined circuit plan. A plurality of spaced-apart electrically conductive posts and at least one electrically conductive rail are mounted on opposite sides of the insulating strip and extend in transverse directions so as to cross the aforesaid apertures in accordance with the predeter-

mined plan. In this manner, preselected posts are welded to preselected rails through commonly crossed apertures, and



are also electrically connected to the various electrical components which thereby connect these components together in accordance with the aforestated predetermined circuit plan.

3,725,745

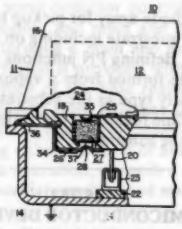
VOLTAGE SURGE PROTECTION DEVICE FOR ELECTRIC METERS

William J. Zisa, Cary, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1971, Ser. No. 182,954

Int. Cl. G01r *1/36*; H02b *9/00*

U.S. Cl. 317—104 **4 Claims**



A voltage surge protection device having a combined current limiter and arc discharge arrangement extending through the enclosure of an electric meter includes an improved outer contact strip with an integrally formed arcing electrode section. A U-shaped bend in the contact strip defines the arcing electrode section and is aligned with the central axis of a cooperating arcing electrode end of the current limiter. A predetermined spark gap spacing is formed between the electrodes for controlling arc discharges within a localized path. The current limiter includes a valve block having a heat shrinkable insulating cover for compressively reinforcing the body of the valve block against mechanical destruction and preventing arcing flashovers.

3,725,746

CONTROL CENTER WITH EXPANDABLE FRAME CABINET

John T. Carroll, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 22, 1972, Ser. No. 265,152

Int. Cl. H02b *1/02*

U.S. Cl. 317—120 **10 Claims**

A control center comprising an integral die cast base and an integral die cast top which are rigidly joined together by structural upright members that provide modular expansability and convenience without sacrificing strength, safety or economy. Inherent with the arrangement is the unitized compartment for electrical control equipment which may be varied to suit a variety of sizes of controls. Included in the compartment is the provision of a wire raceway providing protection and affording ready accessability for servicing. A bus bar compartment is formed as an integral part of the structural unit with convenient access being provided to easily and readily connect the controls to the busses.

3,725,747

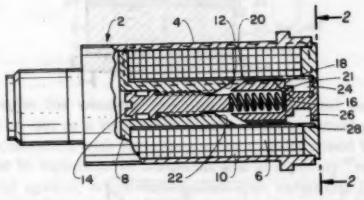
PROPORTIONING SOLENOID

Arnold A. Cowan, Tarzana, Calif., assignor to DeLaval Turbine Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 164,527, July 21, 1971, abandoned. This application Jan. 17, 1972, Ser. No. 218,140

Int. Cl. H01h *47/00*

U.S. Cl. 317—123 **26 Claims**



A solenoid and solenoid-actuated mechanism which is operated under conditions whereby the armature of the solenoid is controllably and variably movable by selected increments by the imposition of such current levels, with respect to armature mass and load forces acting thereon, so as to obtain high armature saturation and by the provision of a solenoid design that permits high magnetic leakage paths so that the armature displacement is a function of input control current which may in several embodiments include an interrupter or switching circuit. Hysteresis is beneficially influenced by the reduction of frictional resistance parameters to obtain high performance characteristics.

3,725,748

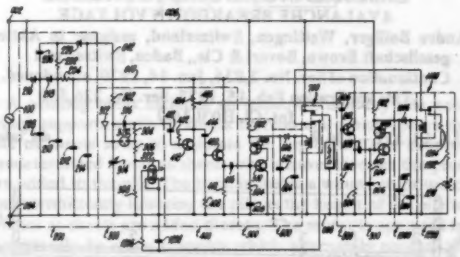
SELF-ADJUSTING CONDITION-RESPONSIVE CONTROL CIRCUIT

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Nov. 8, 1971, Ser. No. 196,440

Int. Cl. H01h *47/12*

U.S. Cl. 317—146 **10 Claims**



The output of an oscillator is normally continuously varied within predetermined limits so that a first, load-controlling relay is normally de-energized and a second relay is normally energized and de-energized alternately to continuously vary the input voltage to a filed-effect transistor connected in the output of said oscillator. Thus, the circuit "hunts" about a reference level of detected capacitance and compensates for both slow variations from that reference level and drift in

values of circuit elements, but will cause a load to become energized in response to a rapid change in detected capacitance.

3,725,749

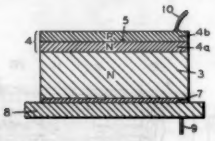
$GaAs_{1-x}Px$ ELECTROLUMINESCENT DEVICE DOPED WITH ISOELECTRONIC IMPURITIES

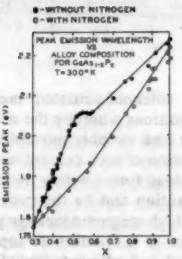
Warren Olley Groves; Arno Henry Herzog, and Magnus George Craford, all of St. Louis County, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed June 30, 1971, Ser. No. 158,312

Int. Cl. H01l *15/00*

U.S. Cl. 317—234 R **16 Claims**





The disclosure herein pertains to the preparation of semiconductor materials and solid-state devices fabricated therefrom. More particularly, the disclosure pertains to a vapor phase process for the preparation of electroluminescent materials, particularly $GaAs_{1-x}P_x$, doped with isoelectronic impurities, particularly nitrogen, and to electroluminescent devices fabricated therefrom.

3,725,750

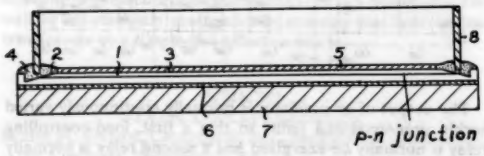
SEMICONDUCTOR DISC HAVING TAPERED EDGE RECESS FILLED WITH INSULATION COMPOUND AND UPSTANDING CYLINDRICAL INSULATING RING EMBEDDED IN COMPOUND TO INCREASE AVALANCHE BREAKDOWN VOLTAGE

Andre Bolliger, Wettingen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie,, Baden, Switzerland

Continuation of Ser. No. 2,834, Jan. 14, 1970, abandoned. This application Feb. 15, 1972, Ser. No. 226,550

Int. Cl. H03l *3/00*

U.S. Cl. 317—234 R **4 Claims**



A disc of semiconductor material includes a P-N transition extending transversely therethrough to a circumferentially extending recess located in a marginal edge portion. The recess is filled with an insulating compound and the end portion of a cylindrical insulating member projects into and is embedded in the insulating compound to increase the breakthrough voltage.

3,725,751

SOLID STATE TARGET ELECTRODE FOR PICKUP TUBES

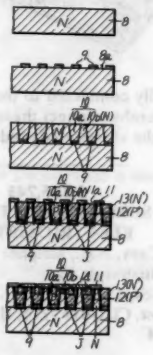
Kinji Wakamiya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 20, 1970, Ser. No. 4,184

Claims priority, application Japan, Feb. 3, 1969, 44/8042

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 317—235 R **6 Claims**



A target using a diode array for pickup tubes which consists of a semiconductor substrate including on one surface thereof an array of regions, defining PN junctions with the major portion of the substrate formed from a vapor-deposited layer of the same conductivity type as the substrate and having a plurality of polycrystalline regions of low resistivity of conductivity type opposite to the substrate.

3,725,752

SEMICONDUCTOR DEVICE

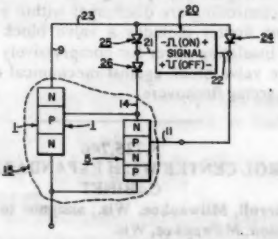
John Mansell Garrett, London, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed Sept. 15, 1971, Ser. No. 180,631

Claims priority, application Great Britain, Oct. 6, 1970, 47,432/70

Int. Cl. H01q *5/00*

U.S. Cl. 317—235 R **1 Claim**



The present disclosure provides a semiconductor device having a first portion which constitutes effectively a transistor and a second portion which constitutes effectively a thyristor; the collector region of the transistor and the anode region of the thyristor being commonly connected to a first lead of the device, the emitter region of the transistor being connected to a second lead of the device, the gated base region of the thyristor being connected to a third lead of the device, and the

base region of the transistor portion and the cathode region of the thyristor being commonly connected to a fourth lead of the device.

3,725,753

INVERSE GATE SEMICONDUCTOR CONTROLLED RECTIFIER

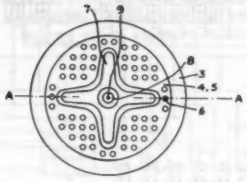
John Mansell Garrett, London, England, assignor to Westinghouse Brake English Electric Semi-Conductors Limited, London, England

Continuation of Ser. No. 40,792, May 27, 1970, abandoned. This application April 14, 1972, Ser. No. 244,310

Claims priority, application Great Britain, June 11, 1969, 29,713/69

Int. Cl. H01l 11/10

U.S. Cl. 317—235 R **17 Claims**



An inverse gate semiconductor controlled rectifier device including a base region, and main and auxiliary emitter regions respectively forming a main and auxiliary PN junction with the said base region is provided with a conductive layer located on the surface of the base region in ohmic contact therewith and extending from adjacent the auxiliary emitter junction to alongside an edge of the main emitter junction but not of itself bridging either the main or auxiliary junction. The conductive layer, in operation, expands a preferential current path between the auxiliary emitter and main emitter along the said edge.

3,725,754

TRANSISTOR CIRCUIT OF COMPOUND CONNECTION

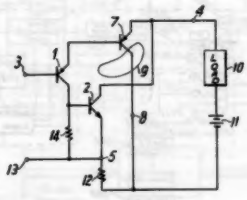
Tokio Furuhashi, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 15, 1972, Ser. No. 263,272

Claims priority, application Japan, June 29, 1971, 46/47778

Int. Cl. H01l 19/00; H03f 1/10

U.S. Cl. 317—235 **5 Claims**



A compound connection transistor circuit in which an additional transistor is connected between a pair of transistors of opposite polarities, to thereby prevent undesired oscillation of the circuit.

3,725,755

SYSTEMS FOR DRIVING REELS AT CONTROLLED SPEED AND POWER AND IMPROVED APPARATUS FOR EFFECTING SUCH DRIVING

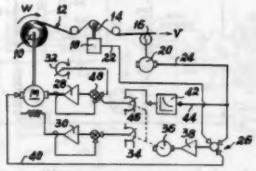
Lucio Stabile, Milan, Italy, assignor to Vanguard U.S., Millbrae, Calif.

Filed Nov. 25, 1970, Ser. No. 92,576

Claims priority, application Italy, Nov. 27, 1969, 25015 A/69

Int. Cl. B65h 25/28

U.S. Cl. 318—6 **10 Claims**



A system for winding and unwinding material on a reel which can act as a regulated system "with constant power", when confronted with variations in the angular speed W of the reel, due to variations of diameter, and as a purely "velocity" regulated system, when confronted with variations in linear velocity V of the material, in transient phases of strong acceleration, by taking advantage of the combination of the availability of the full feeding of the motor field, and of the direct control of values and amounts involved, thereby eliminating the need for recourse to means for approximate simulation of these values.

3,725,756

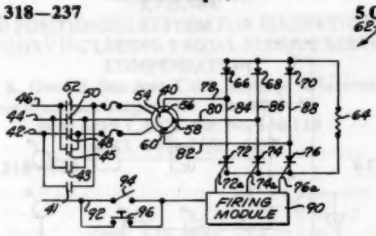
HOIST STATIC CONTROL

Howard M. McConnell, Chagrin Falls, and Abraham Zeewy, University Heights, both of Ohio, assignors to Harris Intertype Corporation, Cleveland, Ohio

Filed Sept. 2, 1970, Ser. No. 68,889

Int. Cl. H02p 5/40

U.S. Cl. 318—237 **5 Claims**

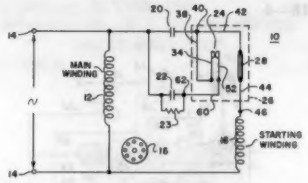


A printing press includes an improved delivery pile hoist which supports a pile of sheets thereon and which lowers the pile of sheets so as to maintain the top of the pile between predetermined levels as sheets which travel through the press are added to the pile. The hoist includes a wound rotor motor for intermittently lowering the pile as the height of the pile increases as sheets are added thereto. The motor is operated intermittently by static circuitry which alternately renders the rotor windings conductive and non-conductive to currents induced therein. When the rotor windings are non-conductive, current will not flow through the rotor windings and the motor will not operate to move the hoist. When the windings are conductive, induced current will flow in the rotor windings and will cause the rotor to turn and lower the hoist. The present construction is operable to accurately control the height of the pile of sheets and has a simple and reliable construction which has a much longer life than conventional magnetic starters.

3,725,757
STARTING CIRCUIT FOR PERMANENT SPLIT CAPACITOR MOTOR

Henry Ehrens, Bayside, N.Y., and Charles W. Slocum, Spring Lake Heights, N.J., assignors to Thermo-Electronics, Inc., Allenwood, N.J.

Filed May 13, 1971, Ser. No. 143,016
Int. Cl. H02p 1/44
U.S. Cl. 318—221 C 3 Claims

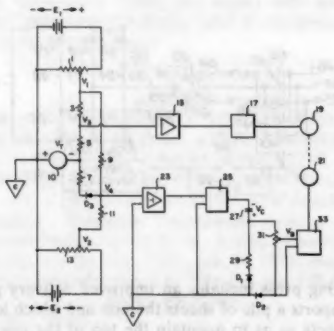


A starting circuit for a permanent split capacitor motor having a main field winding, a starting field winding, a running capacitor, and a supplementary starting capacitor. A thermal relay is provided having normally closed switch contacts coupling the supplementary starting capacitor across the running capacitor and a bimetallic element serially coupled with the starting winding and running capacitor across the main winding. The bimetallic element opens the switch contacts thereby to disconnect the starting capacitor in response to a first predetermined current flow in the starting wind-ing circuit and maintains the switch contacts open in response to a lower current flow.

3,725,758
AUTOMATIC FEEDBACK CLOSED LOOP SYSTEM FOR FORWARD SPEED CONTROL AND BRAKING CONTROL

Victor Loyk, Herndon, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 1, 1971, Ser. No. 148,507
Int. Cl. H02p 5/16
U.S. Cl. 318—269 6 Claims

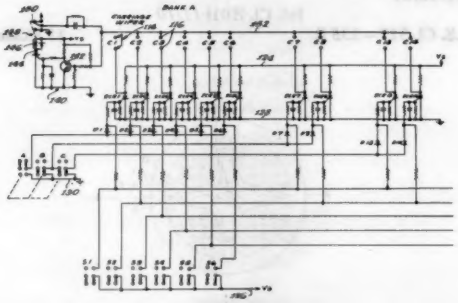


This invention controls a dynamo-electric device, such as a DC motor for running at a desired operating speed. The motor speed is maintained at the desired level by feeding back a tachometer voltage indicative of the motor speed, to an adder whose output provides a positive polarity error signal. The error signal is amplified in two channels: an under speed channel and an over speed channel. The under speed channel provides a signal to a motor current control device which supplies the current to the motor to maintain the motor speed. An over speed signal is applied across a charged capacitor. The over speed signal being less than the voltage indicating the set speed charge on the capacitor, the capacitor discharges generating an over speed signal. This over speed signal is then applied to a braking control device which controls a mechanical brake.

3,725,759
SWITCHING SYSTEM

William E. Olliges, Chicago; Edward L. Polanek, Glendale Heights, and Robert Gurney, Chicago, all of Ill., assignors to Universal Research Laboratories, Incorporated

Division of Ser. No. 75,359, Sept. 25, 1970. This application June 15, 1972, Ser. No. 263,179
Int. Cl. G05b 11/26
U.S. Cl. 318—467 6 Claims

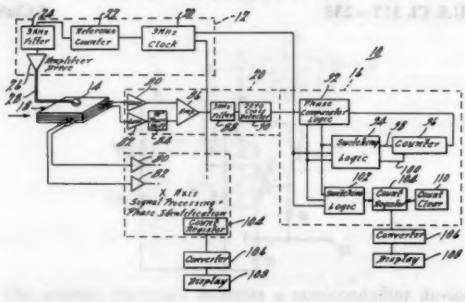


A tape cassette playing system using a magazine holding a number of cassettes is provided, in which a tape playing carriage moves along tracks adjacent the magazine to hunt for a selected one or more of the number of cassettes. The system has a memory to store information as to the selected cassettes. When a first selected cassette is found, it is automatically removed from the magazine and moved laterally into the carriage for playing. After the first cassette has been played, it is automatically returned to the magazine and the carriage hunts for another selected cassette.

3,725,760
AUTOMATIC PLOTTER UTILIZING A COORDINATE GRID DEVICE

Knight V. Bailey, Birmingham, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 805,559, March 10, 1969, Pat. No. 3,647,963. This application Aug. 12, 1971, Ser. No. 171,230
Int. Cl. G05b 19/42
U.S. Cl. 318—568 7 Claims



A device for determining position coordinates of points on a surface which includes a conducting grid structure having at least two grid elements to be placed over or under a surface and a cursor structure having a circular conducting loop element to be moved across the surface of the grid structure. An alternating electric signal is supplied to either the cursor con-

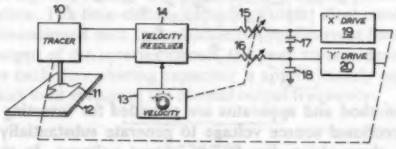
ducting loop or to each of the conducting grid elements. This signal induces a signal in each element of the unexcited conducting structure. Position coordinates are determined by apparatus which measures the induced signal or signals and records the signal change produced when the cursor is moved across the grid surface. Several embodiments of measuring devices which determine the distance between arbitrary points on a surface such as a map, graph, or photograph are illustrated. Automatic plotting embodiments are also shown and described in which the plotting motion is determined by comparing signals representing the measured loop position on the grid with a preselected set of command signals.

3,725,761

SERVO CORNER COMPENSATION FOR PHOTOELECTRIC ROTARY SCAN LINE TRACERS

Henry Webber, Dundas, Ontario, Canada, assignor to Westinghouse Canada Limited, Hamilton, Ontario, Canada

Filed Oct. 22, 1971, Ser. No. 191,743
Claims priority, application Canada, Oct. 26, 1970, 096,473
Int. Cl. G05b *19/36*
U.S. Cl. 318—577 **3 Claims**



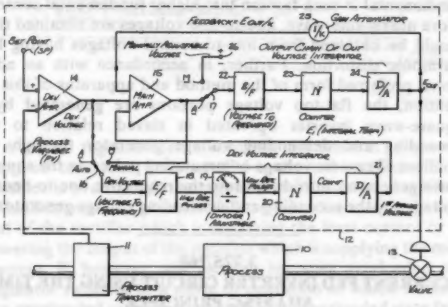
Rotary scanning pattern tracers observe the pattern at points in advance of the steering center of the follower. When due to other requirements, the circle of scan is large. This may result in rounding off of sharp corners, because in effect the center of steering is trailed along behind the forward scanning point. By selection of suitable steering signal delay characteristics this error can be reduced.

3,725,762

HYBRID PROCESS CONTROLLER OPERABLE IN THE AUTOMATIC AND MANUAL

Peter S. Levesque, Jenkintown, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Aug. 5, 1971, Ser. No. 169,375
Int. Cl. G05b *7/00*
U.S. Cl. 318—591 **8 Claims**



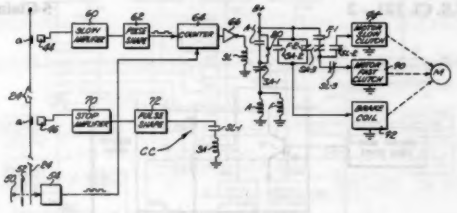
An electronic controller forming a part of a process control system in which a signal representative of a process variable is compared with a set point signal to produce an output signal to operate a final control element. The controller includes a hybrid digital-analog configuration which permits bumpless transfer between automatic and manual modes, in an arrangement which is drift-free in the manual mode and does not require a long resistor-capacitor time constant.

3,725,763

BACK GUAGE POSITION CONTROL FOR A PAPER CUTTING MACHINE

Henry J. Tokarz, East Lake, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Nov. 27, 1970, Ser. No. 93,127
Int. Cl. G05b *19/26*
U.S. Cl. 318—600 **8 Claims**



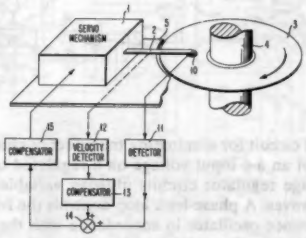
A paper cutting machine control is provided for controlling the positioning of a movable back gauge relative to a guillotine type cutting tool. The back gauge is driven by a motor so as to normally advance toward the tool at a high speed and is controlled to a low speed or a stopped condition in dependence upon position command marks recorded on a control record. Relative motion proportional to the back gauge velocity is imparted between the control record and mark sensors, which includes both low speed and stop sensors for sequentially sensing each mark and respectively providing a low speed control signal and a stop control signal. These signals are respectively used for controlling the motor so that the back gauge is driven at its low speed or is at its stopped condition. The low speed sensor includes two sensing means spaced apart by a sufficient distance so that at least one low speed control signal is provided as the relative motion is being decreased to zero.

3,725,764

SERVO POSITIONING SYSTEM FOR MAGNETIC DISK MEMORY INCLUDING RADIAL RUNOUT SERVO COMPENSATION

Richard K. Oswald, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed April 1, 1971, Ser. No. 130,118
Int. Cl. G05b *11/01, 6/02*
U.S. Cl. 318—629 **6 Claims**



Servo apparatus for accurately following a servo track on a moving surface. The track possesses a degree of radial runout from a nominal position. A first transducer is mounted on a movable arm to indicate the lateral direction and distance from the servo track. The movable arm is positioned laterally with respect to the servo track by a servo motor. A second transducer measures the velocity of said first transducer for generating a signal indicative of the magnitude of the radial runout existing within the servo positioning system. Cor-

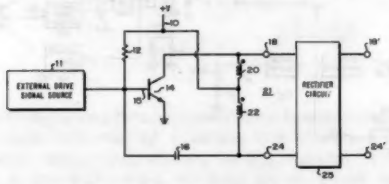
rection means is used to combine the output from said first transducer and from second transducer to produce a positioning error signal to the servo motor such that the first transducer will exactly follow the radial runout present in the servo positioning system.

3,725,765

SWITCH-TYPE D.C. TO D.C. CONVERTER

Chu-Sun Yen, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 22, 1971, Ser. No. 200,763
Int. Cl. H02m 3/22
U.S. Cl. 321—2 **5 Claims**



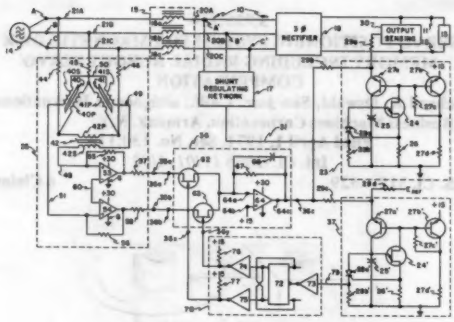
A transistor coupled to a nonsaturating transformer is provided with a capacitive feedback path to form a D.C. to D.C. converter.

3,725,766

FREQUENCY COMPENSATING CIRCUIT FOR VOLTAGE REGULATORS

Harold J. Brown, Lorain, Ohio, assignor to Lorain Products Corporation

Filed Aug. 17, 1972, Ser. No. 281,479
Int. Cl. H05b 37/02
U.S. Cl. 321—5 **12 Claims**



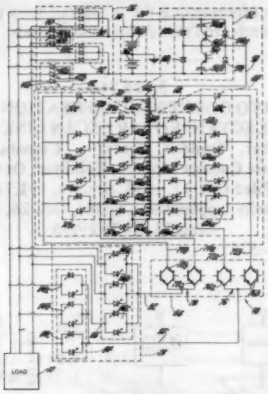
A control circuit for eliminating the effect of changes in the frequency of an a-c input voltage on a regulated output voltage in voltage regulator circuits utilizing variable frequency regulating waves. A phase-lock loop controls the frequency of a first, reference oscillator in accordance with the frequency of the a-c input voltage to provide a frequency error signal proportional to the difference between the actual frequency of the input voltage and the nominal frequency of that voltage. The frequency error signal is applied to a second, control oscillator which is not part of the phase-lock loop. This allows the control oscillator to follow input voltage frequency variations without being locked in phase to the input voltage and thus allows the control oscillator to be controlled in accordance with the magnitude as well as the frequency of the a-c input voltage.

3,725,767

METHOD OF AND APPARATUS FOR GENERATING THREE-PHASE SINUSOIDAL VOLTAGES

Thomas M. Corry, Goleta, Calif., assignor to General Motors Corporation

Continuation-in-part of Ser. No. 83,358, Oct. 23, 1970, abandoned. This application March 26, 1971, Ser. No. 128,330
Int. Cl. H02m 7/52
U.S. Cl. 321—5 **19 Claims**



A method and apparatus are provided for inverting input unidirectional source voltage to generate substantially sine-wave, three-phase, line-to-line output voltages. In the apparatus, most of the power transfer from the unidirectional source to the load conductors is effected through flat-top "power center" portions of line-to-neutral generated voltages. A minor proportion of the power to the load is supplied by an ascending and descending voltage generator which, in the three-phase system, produces alternate pairs of stepped ascending and descending voltages at a frequency equivalent to at least three times the fundamental frequency of the substantially sinusoidal output voltages. The ascending and descending voltages are selectively switched to complement the power center voltage of each phase voltage to complete the line-to-neutral waveforms. The respective line-to-neutral voltages are phase displaced 120° in relation to each other and are combined to form three-phase, line-to-line voltages characterized by a high fundamental frequency content and low harmonic distortion. In accordance with one preferred form of the method and apparatus of this invention, the waveform of the line-to-neutral voltages outboard the flat power center is based on a departure from the line-to-neutral fundamental in such fashion that higher fundamental content, more nearly sine-wave, line-to-line voltages are obtained than would be obtained from line-to-neutral voltages having less harmonic distortion. Further, in accordance with an additional preferred form of the method and apparatus of this invention, the flat-top voltage portions are generated by a square-wave inverter operated in slaved relation to the ascending and descending voltage generator through the medium of reverse voltage commutating pulses, to the square-wave generator, introduced into the respective line-to-neutral voltages by the ascending and descending voltage generator.

3,725,768

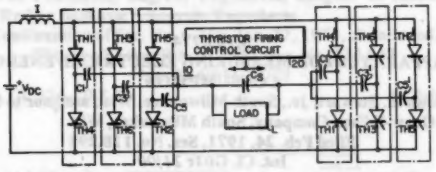
CURRENT FED INVERTER CIRCUIT USING THE TIME SHARING PRINCIPLE

Brian R. Pelly, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 7, 1971, Ser. No. 150,574
Int. Cl. H02m 7/52
U.S. Cl. 321—6 **6 Claims**

A current fed inverter circuit operating in a time-sharing mode to supply A.C. output voltage to a load from a D.C. volt-

age source. Typically the load may be inductive, for example, an induction heating work coil, in which case a capacitor is connected across it to correct the power factor. So-called "time-sharing" capacitors are connected in series between the solid state switching devices of the inverter circuit, which are typically thyristors, and the electrical load. Under all output voltage conditions up to and including the preferred full load



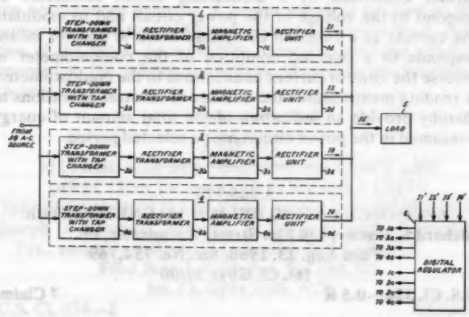
voltage operating condition the phase displacement between the output voltage and output current is such that the current always lags the voltage thus establishing a lagging phase angle operation. The time-sharing capacitors under ideal conditions are dimensioned such that with the full load current flowing at the output of the inverter circuit, the peak voltage developed across each time-sharing capacitor is approximately equal to the peak load voltage at the normal output frequency.

3,725,769

DIGITAL REGULATOR AND METHOD OF CURRENT REGULATION

Robert P. DePuy, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Jan. 10, 1972, Ser. No. 216,681
Int. Cl. H02m 1/18
U.S. Cl. 321—14 **13 Claims**



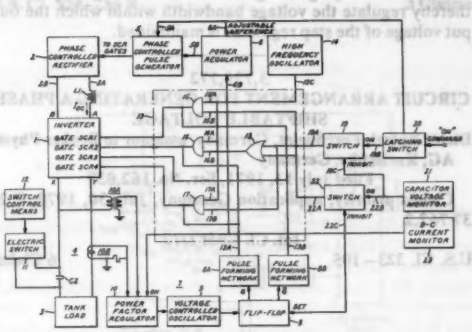
A digital regulator for controlling the amount of current supplied to a load from parallel-connected rectifiers. If no rectifier is overloaded, the regulator maintains the magnitude of load current at a preselected level by either raising the output of the rectifier which is supplying the least current or by lowering the output of the rectifier which is supplying the most current. If, however, any rectifier becomes overloaded, the regulator switches to a mode of operation in which it allows the overloaded rectifier to operate in its overloaded state for a predetermined period of time, after which its current output is lowered. If the lowering of the current output of the overloaded rectifier causes the magnitude of load current to drop below the preselected level, the regulator will, after lowering the output of the overloaded rectifier, raise the output of the rectifier which has been continuously operating in range for the longest period of time.

3,725,770

STARTING CIRCUITRY FOR SERIES/PARALLEL COMPENSATED, CURRENT-FED INVERTER

Ronald B. Bailey, Waynesboro, Va., assignor to General Electric Company, Philadelphia, Pa.

Filed July 25, 1972, Ser. No. 274,895
Int. Cl. H02m 7/48
U.S. Cl. 321—45 R **5 Claims**



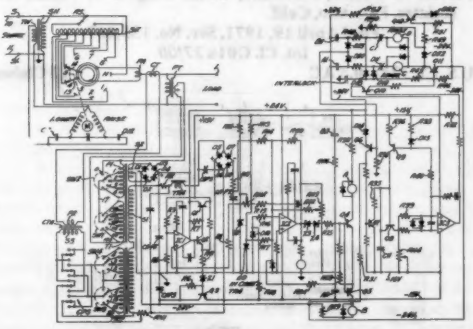
In a thyristor-composed, current-source, inverter including a series compensating capacitor for supplying energy to a tank load, means are provided for starting the inverter from a non-operating state. To that end the compensating capacitor is charged by direct current flowing through a path formed by the conduction of certain inverter thyristors and at the first time after the commencement of such conduction certain other thyristors are rendered conductive to enable the magnitude of the direct current to build up. At a second time after the commencement of conduction of said other thyristors, alternate triggering of the inverter thyristors is commenced and alternating current flows through the load. The voltage on the compensating capacitor commutates inverter current until the load is charged sufficiently to commutate current on its own.

3,725,771

STATIC CONTROL FOR STEP VOLTAGE REGULATOR

Thomas P. Gilmore, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 16, 1971, Ser. No. 181,076
Int. Cl. G05f 1/20
U.S. Cl. 323—20 **32 Claims**



A control for a step voltage regulator having a reversible motor for actuating a tap changer switch to vary the regulator output voltage when a "raise" or a "lower" signal respectively is applied thereto, includes a potential sensing transformer for deriving a sample DC voltage proportional to the regulator output voltage, a zener diode for deriving a DC reference voltage of opposite polarity to said sample voltage, a summing

operational amplifier which receives the sample and the reference voltages on its inverting input, a polarity and magnitude sensor including a pair of oppositely-poled, serially-arranged zener diodes coupled to the output of the summing amplifier and a NPN and PNP transistor having commoned bases coupled to the pair of zener diodes for deriving raise and lower signals when the output voltage from the summing amplifier is of predetermined magnitude and of opposite polarity, and a rheostat for varying the gain of the summing amplifier to thereby regulate the voltage bandwidth within which the output voltage of the step regulator is maintained.

3,725,772

CIRCUIT ARRANGEMENT FOR GENERATING A PHASE-SHIFTABLE VOLTAGE

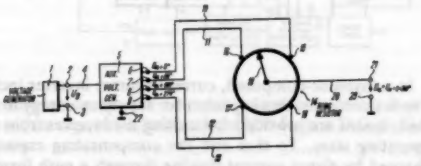
Dieter Ratzel, Forchheim, Germany, assignor to Bruker Physik AG, Karlsruhe, Germany

Filed July 13, 1971, Ser. No. 162,037

Claims priority, application Germany, July 30, 1970, P 20 37 762.2

Int. Cl. G05f 1/12

U.S. Cl. 323—105 **6 Claims**



A circuit arrangement for the generation of a voltage, the phase position of which relative to a reference voltage can be shifted within wide limits, preferably between 0° and 360°, characterized in that said circuit arrangement comprises a device for generating from the reference voltage at least three auxiliary voltages having a certain phase shift relative to each other, that an ohmic resistor with taps is provided to which the auxiliary voltages are supplied, that the geometric distance of the taps from each other is proportional to the phase angle of the auxiliary voltages connected to the taps, and that the ohmic resistor is provided with a wiper to which the output terminal of the circuit arrangement is connected.

3,725,773

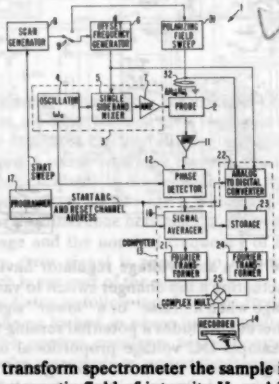
AN RF SPECTROMETER HAVING MEANS FOR EXCITING RF RESONANCE OF A PLURALITY OF RESONANCE LINES SIMULTANEOUSLY USING A HIGH SPEED SCANNING MEANS

Forrest A. Nelson, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed April 19, 1971, Ser. No. 135,257

Int. Cl. G01n 27/00

U.S. Cl. 324—0.5 AC **13 Claims**



In a Fourier transform spectrometer the sample is immersed in a polarizing magnetic field of intensity H_0 and is irradiated with radio frequency energy of a frequency ω. The ratio of ω to H_0 is rapidly and repetitively scanned over a range of values to repetitively excite resonance of a plurality of resonance lines within the sample. The scanning repetition frequency is sufficiently high to sustain simultaneous resonance of the plurality of excited resonance lines. A signal representative of the composite resonance signal emanating from the sample and containing the plurality of simultaneous excited signals is complex multiplied by a signal representative of said scan frequency.

3,725,774

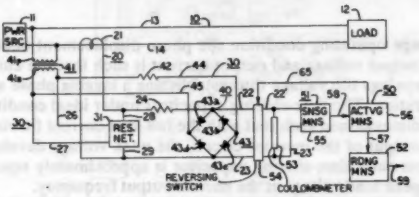
APPARATUS FOR MEASURING ELECTRICAL ENERGY CONSUMPTION

Victor E. Stewart, Jr., South Milwaukee, Wis., assignor to McGraw-Edison Company, South Milwaukee, Wis.

Filed Feb. 24, 1971, Ser. No. 118,295

Int. Cl. G01r 21/00

U.S. Cl. 324—142 **34 Claims**



A current transformer is connected to an electrical power circuit to provide a measure of the current in the power circuit. The current measure is applied through a reversing switch and a diode rectifying bridge to a coulombmeter and is controlled by commutating the bridge with a voltage from a voltage transformer connected to the electrical power circuit. The connections are made to apply current to the coulombmeter during the portion of the current cycle that occurs during a selected voltage half-cycle. The current measure is further controlled by a modulating circuit connected to respond to the voltage of the power circuit and to modulate the current as a function of voltage level. A control means responds to a selected condition of the coulombmeter to reverse the control current connections to the coulombmeter. A reading means senses the number of reversal operations to thereby provide an indication of the total amount of energy consumed in the power circuit over a selected period.

3,725,775

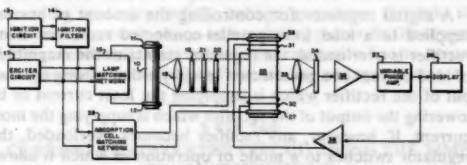
SELF-OSCILLATING HELIUM MAGNETOMETER

Richard E. Gasser, 430 Elm Street, Warminster, Pa.

Filed Aug. 23, 1968, Ser. No. 754,769

Int. Cl. G01r 33/00

U.S. Cl. 324—0.5 R **7 Claims**



A self-oscillating magnetometer having a metastable helium atom absorption cell optically pumped with the light emission line of 3888.65 Angstroms wavelength. The amount of light transmitted through the absorption cell at this wavelength is sensed by a photo-detector which has relatively high spectral response at the same wavelength. The photo-detector output signal provides a signal to a pair of Helmholtz coils for

generating an RF resonance frequency field in the absorption cell and a signal to a display indicative of the ambient magnetic field strength.

3,725,776

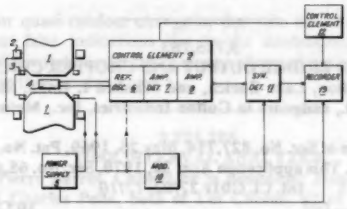
ABSORPTION DETECTOR FOR NUCLEAR MAGNETIC RESONANCE MEASUREMENTS WITH A FREQUENCY CONTROL

Marko Petrinovic, Zagreb, Yugoslavia, assignor to Institute "Rudjer Boskovic", Zagreb, Yugoslavia

Continuation of Ser. No. 6,250, Jan. 27, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 224,042

Int. Cl. G01n *27/78*

U.S. Cl. 324—0.5 R **4 Claims**



An absorption detector for determining nuclear magnetic resonance with automatic frequency control. The detector comprises a sample holder including coils, a reference oscillator including a tank circuit being coupled to these coils. A magnet is provided including modulating coils and power coils and having a gap in which the holder is positioned. The oscillator includes a low-noise amplifier and impedor, and a limiter connected in feedback relation with the amplifier via the impedor. A low-frequency amplifier is provided and a synchronous detector is coupled via the low-frequency amplifier to the low-frequency amplifier. An XY recorder is coupled to the synchronous detector, and a modulating oscillator is coupled to the modulating coils, the reference oscillator and the synchronous detector. A power supply is coupled to the power coils and to the XY recorder to determine the X position of the latter. An automatic control is provided which is coupled to the reference oscillator to control the frequency thereof.

3,725,777

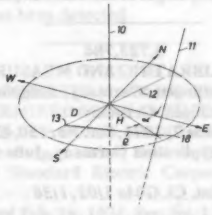
METHOD FOR DETERMINING DISTANCE AND DIRECTION TO A CASED BOREHOLE USING MEASUREMENTS MADE IN AN ADJACENT BOREHOLE

Joseph D. Robinson, and John P. Vogiatzis, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed June 7, 1971, Ser. No. 150,327

Int. Cl. G01v *3/08, 3/18*

U.S. Cl. 324—8 **6 Claims**



A method for locating a cased borehole from an adjacent open borehole wherein the casing has a remanent magnetization and measurements are made in the adjacent open borehole of the total magnetic field and magnetic and gyro compass deflections.

3,725,778

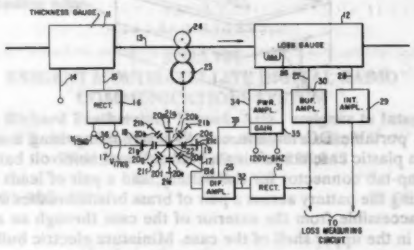
TESTING APPARATUS HAVING IMPROVED MEANS FOR MAINTAINING A CONSTANT DENSITY OF MAGNETIC FLUX INDUCED IN A MOVING STRIP OF METAL

Stephen C. Leonard, Cheshire, and Maurice D. Dilick, Pittsfield, both of Mass., assignors to General Electric Company

Filed July 6, 1971, Ser. No. 159,849

Int. Cl. G01r *33/12*

U.S. Cl. 324—34 R **3 Claims**



A synchronous time delay is provided to assure substantially constant flux density in a moving strip of steel where it passes through a relatively stationary loss measurement guage in a continuous steel tester system. This synchronous delay system utilizes a rotary make-before-break switch with associated signal storage means to transfer a signal representative of the thickness of a section of the moving strip at a first position to control the flux density of the same section at a second position.

3,725,779

APPARATUS FOR TESTING THE ELECTRICAL CONDUCTIVITY OF FILAMENTS

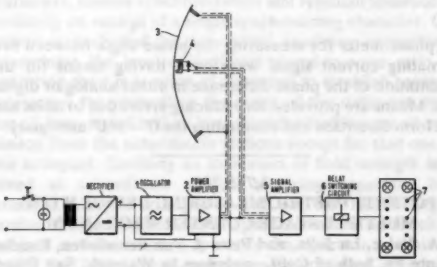
Gerhard Mauer, An der Teichbreite 6, 318 Wolfsburg, Germany

Filed Nov. 27, 1970, Ser. No. 93,159

Claims priority, application Germany, Nov. 29, 1969, P 19 60 103.7

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **1 Claim**

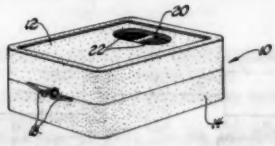


Apparatus for testing filaments embedded in a material in which the filaments are connected to alternating voltage current and the alternating fields produced by the alternating currents are measured as flowing through the individual filaments by means of induction coils to which a signal transmitter and recorder are connected.

3,725,780
PORTABLE MINIATURE BULB TESTER HAVING BRISTLE BRUSHES FOR CONTACTING THE BULB TERMINALS

Richard Emil Olin, 2840 North Adams Road, Troy, Mich.

Filed Jan. 7, 1971, Ser. No. 104,712
Int. Cl. G01r *31/22, 31/02*
U.S. Cl. 324—51 7 Claims

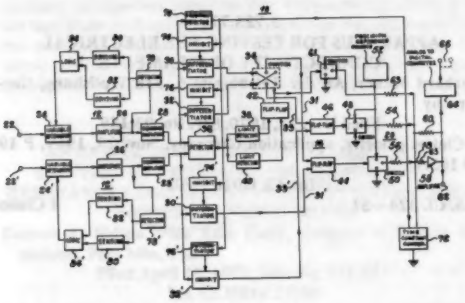


A portable DC miniature bulb tester comprising a snap-open plastic case containing a conventional nine-volt battery, a snap-tab connector for the battery, and a pair of leads connecting the battery across a pair of brass bristle brushes which are accessible from the exterior of the case through an aperture in the upper shell of the case. Miniature electric bulbs of various base types may be tested by connecting the base terminals across the brushes.

3,725,781
PHASE METER WITH NOISE ERROR REDUCTION MEANS

Philip P. Cox, Piscataway, N.J., assignor to Dranetz Engineering Laboratories Inc., Plainfield, N.J.

Filed March 17, 1971, Ser. No. 125,123
Int. Cl. G01r *25/00*
U.S. Cl. 324—83 A 14 Claims



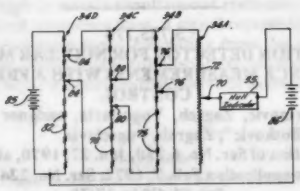
A phase meter for measuring the phase angle between two alternating current signal waveforms having means for the presentation of the phase difference in either analog or digital form. Means are provided for reducing errors due to noise and waveform distortion and eliminating the 0° – 360° ambiguity.

3,725,782
POTENTIOMETRIC MEASURING DEVICE WITH MULTIPLE STAGE COUNTER MECHANISM

Joel A. Naive, La Jolla, and Peter J. Van Benschoten, Rancho Santa Fe, both of Calif., assignors to Wavetek, San Diego, Calif.

Division of Ser. No. 561,558, June 29, 1966. This application July 9, 1970, Ser. No. 53,372
Int. Cl. G01r *17/02*
U.S. Cl. 324—98 9 Claims

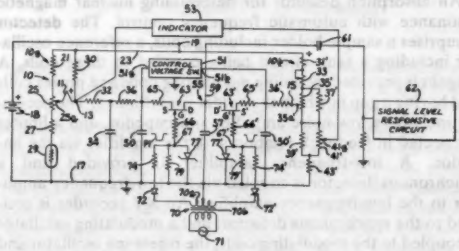
In a potentiometric measuring counter assembly comprising rotary counters corresponding to successive orders of integers, the transfer means from each lower order counter to the next higher order counter is unidirectional to transmit a carry from the lower order counter to the higher order counter but to prevent the higher order counter from operating the lower order counter.



3,725,783
COMBINED BRIDGE OUTPUT AND CHOPPER CIRCUIT

Ahdor H. Alton, Lake Zurich, and Mitchell I. Kohn, Skokie, both of Ill., assignors to Gulton Industries, Inc., Metuchen, N.J.

Division of Ser. No. 827,714, May 26, 1969, Pat. No. 3,591,077. This application Aug. 20, 1970, Ser. No. 65,626
Int. Cl. G01r *27/02, 17/10*
U.S. Cl. 324—101 10 Claims



A bridge output circuit is coupled between bridge output terminals of a D.C. bridge circuit including impedance means coupled between at least one of the bridge output terminals and a first output circuit terminal between which terminal and a common D.C. voltage input terminal of the bridge is coupled a capacitor,and a control signal input is arranged so the capacitor charges to a voltage which is a function both of the control voltage input and the voltage at the associated bridge output terminal. A chopping circuit comprising a pair of field effect transistors is coupled between the aforementioned output circuit terminal and another capacitor associated with the other bridge output terminal. A common capacitor at the juncture between the field effect transistors is alternately coupled by switching the field effect transistors alternately to the two aforementioned capacitors so that the common capacitor charges between the voltages of the other two capacitors.

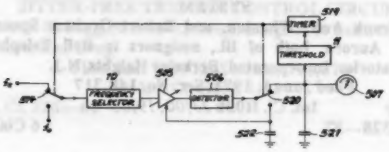
3,725,784
AUTOMATIC CALIBRATING AND MEASURING SYSTEM

Herbert Bayer, Reutlingen, Germany, assignor to Wandel u. Goltermann, Reutlingen, Germany

Filed June 7, 1971, Ser. No. 150,438
Claims priority, application Germany, June 24, 1970, P 20 31 045.6
Int. Cl. G01r *1/02, 1/38*
U.S. Cl. 324—130 8 Claims

A system with a test position for measuring the amplitude (or phase) of an incoming signal wave of predetermined frequency is repetitively switched over to a calibrating position in which the system receives a reference oscillation of constant frequency and phase for automatically readjusting its circuits, if necessary. If the input signal disappears or drops

below a certain minimum level, a sensing circuit reduces the rate of switchover or arrests the system in test position to reduce wear of the relay contacts employed therefor. A ran-



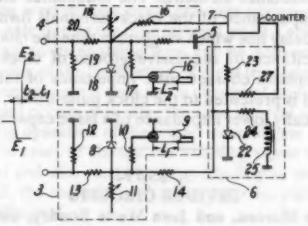
dom or quasi-random change in that rate may be utilized to prevent false indications due to the stroboscopic effect of periodic switchover in the presence of a modulating frequency close to the switching rate.

3,725,785

TIME INTERVAL ANALYZER

Jean-Pierre Barrot, Chemin de la Bouhume; Jacques Negrou, and Charles Pelte, both of Les Chenes, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed March 2, 1971, Ser. No. 120,160
Claims priority, application France, March 3, 1970, 7007533
Int. Cl. G04f 9/00
U.S. Cl. 324—188 **1 Claim**



In an analyzer for time intervals which are defined by two successive electrical pulses each appearing in a separate channel, a first generator delivers recurrent rectangular signals having a period *T*1 and is triggered by the first pulse, a second generator delivers recurrent rectangular signals having a period *T*2 of slightly smaller value than the period T1 and is triggered by the second pulse, the signals emitted by each generator being of opposite polarity. Means are provided for detecting the phase reversal of the leading edges of said signals, and a counter which is driven by one of said generators is stopped by said means when a phase reversal of the leading edges has been detected.

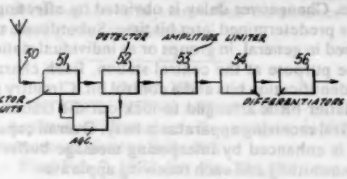
3,725,786

SYSTEM FOR DISCRETE MARKING AND DETECTING A PREDETERMINED POINT IN TIME WITHIN THE ENVELOPE OF A PULSE MODULATED CARRIER

Charles William Earp, London, N.W. 3, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,214
Claims priority, application Great Britain, March 5, 1970, 10,624/70
Int. Cl. H04b 1/38
U.S. Cl. 325—15 **5 Claims**

The radiator pulse of an aircraft distance measuring equipment is characterized by a radio frequency phase reversal at its mid-point in time, hence producing a sharp cusp of zero



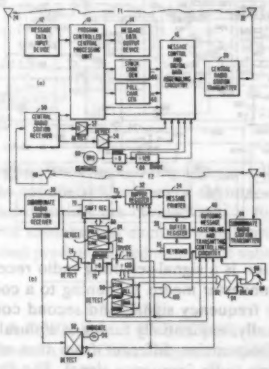
amplitude which is more easily identified and measured than the leading edge.

3,725,787

EXIGENT MULTISATELLITE DIGITAL RADIO COMMUNICATIONS SYSTEM

John Richard Featherston, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,342
Int. Cl. H04b 1/00
U.S. Cl. 325—58 **19 Claims**



The reliability and efficacy of traffic control in multiple station exigent radio communications is assured by a digital data communication system having accelerated polling and lockout of satellite or circumjacent subordinate station transmitting apparatus when the subordinate stations are contending for the attention of the central or base station and/or a circumjacent station is located in an area of unfavorable radio wave propagation. Duplex frequency operation with the central station continuously broadcasting messages and/or synchronizing characters, assures synchronization and resynchronization immediately on receipt of a single synchronizing character. Contention is evaluated in the central receiving apparatus by determining the level of optimum signal-to-noise ratio and measuring the r.m.s. value of distortion to establish reception parameters for controlling the mode of the radio net operation. A busy signal is then broadcast for locking out all transmission from the subordinate stations except for that one station accepted. Similarly an indication of field strength is obtained at subordinate station receiving apparatus by a threshold detector arranged to lock out the transmitting apparatus for propagation levels predetermined as unreliable and in a mobile situation to notify the operator to move the station to a better location for communication. Current flow in the second limiter stage of an FM receiver is suggested as a base measurement over a predetermined time period to prevent backlash. Confirmation, acknowledgment, and roll call are controlled by a polling character transmitted at the end of a message. Circuitry responsive to these characters is arranged for conducting an accelerated poll for effecting a single bit response from each circumjacent transmitter addressed specifically in a poll as listed in a predetermined time assign-

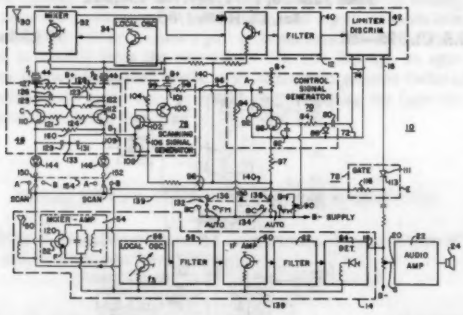
ment. For the latter arrangement a shift register used for normal data processing is arranged to double as a counter for this purpose. Changeover delay is obviated by effecting transmission at a predetermined later bit time. Subordinate stations are addressed in general, in groups or as individual stations as best suits the purpose at the central station. Each character comprises identification bits and a control bit. Circuitry responsive to the latter bit is arranged to lock out the transmitter when the central receiving apparatus is busy. Overall capacity of the system is enhanced by interposing message buffer stores for each transmitting and each receiving apparatus.

3,725,788

SIGNAL-SELECTING RADIO RECEIVER

George H. Fathauer, Decatur, Ill., assignor to Masco Corporation, Taylor, Mich.

Filed Oct. 1, 1971, Ser. No. 185,585
Int. Cl. H04b 1/32
U.S. Cl. 325—469 **30 Claims**



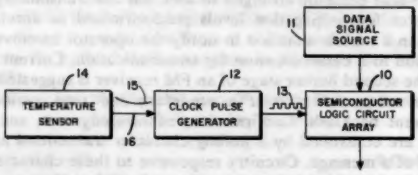
The invention is a signal-selecting radio receiver which includes first converter means for tuning to a continuously occurring radio frequency signal, and second converter means for automatically, sequentially tuning to a plurality of discrete, preselected frequencies different from that of the continuously occurring radio frequency signal. The first and second tuner means operate simultaneously and the second tuner means includes circuitry for automatically switching the receiver from one of the discrete frequencies to another in sequence until a signal is received. There is also provided circuitry which disables the second tuner in the absence of a signal on any of the discrete frequencies and for disabling the first tuner means and locking the second tuner means in condition to receive one of the discrete frequencies upon reception of a signal on that frequency.

3,725,789

TEMPERATURE CONTROLLED CLOCKING OF LOGIC CIRCUITS

Donald V. Mager, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 21, 1970, Ser. No. 99,879
Int. Cl. H03k 7/00
U.S. Cl. 328—3 **4 Claims**



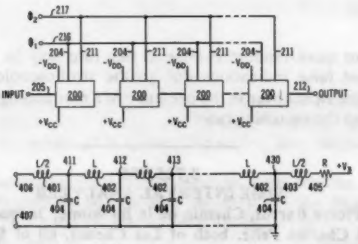
A variable frequency pulse generator whose pulse repetition rate is controlled as a function of temperature is used as a source of gating signals for a logic array so that the propagation delay of data signals through the logic array is optimized.

3,725,790

SHIFT REGISTER CLOCK PULSE DISTRIBUTION SYSTEM

Cyrus Frank Ault, Wheaton, and Robert Graham Spencer, North Aurora, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed June 1, 1971, Ser. No. 148,317
Int. Cl. H03k 23/00, 19/08
U.S. Cl. 328—37 **6 Claims**



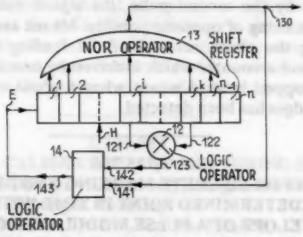
A clock pulse distribution bus for an MOS shift register having a large clock terminal input capacitance comprises a plurality of serially connected inductance elements. The shift register stages are organized into groups and the clock terminals of each group are connected to a different node of the bus between inductance elements. The inductance elements and the input capacitance of the clock terminals form a lumped parameter delay line which staggers in time the charging of the input capacitance of successive groups of clock terminals. Only the resistive characteristic impedance of the delay line thus formed is presented to the clock pulse driver, rather than the dynamically lower impedance of a large capacitive load.

3,725,791

DIVIDER CIRCUITS

Jean Pierre Moreau, and Jean Marie Boudry, both of Paris, France, assignors to Sescosem-Societe Europeene de Semiconducteurs et de Microelectronique

Filed Aug. 13, 1971, Ser. No. 171,592
Claims priority, application France, Aug. 21, 1970, 7030699
Int. Cl. H03k 21/36
U.S. Cl. 328—41 **3 Claims**



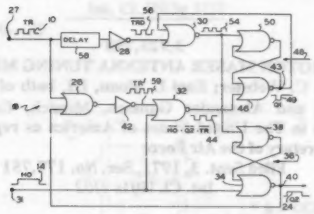
A divider circuit, comprising an n-stage shift register having a feedback loop for maximum periodicity, is provided. A NOR operator has $n-1$ inputs connected with the first $n-1$ steps of said register and one output, constituting the single output of said divider circuit, loop-connected on to the divider input through an OR operator having a first and a second input, said first input being connected with said divider output and said second input being connected with the output of an "exclusive

OR" operator having two inputs respectively connected with two predetermined steps of said register. The division ratio is 2^n or 2^n-1 according as said OR operator is exclusive or non-exclusive.

3,725,792
JITTER-FREE TRIGGER CONTROL CIRCUIT

James R. Kellogg, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 7, 1972, Ser. No. 216,070
Int. Cl. H03k 4/08
U.S. Cl. 328—60 **9 Claims**

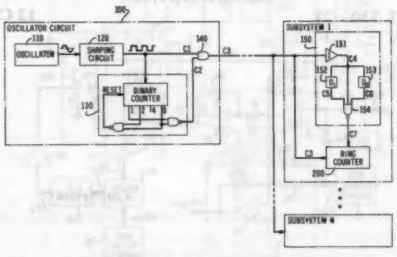


An enabling signal for a trigger control logic gate is changed from a non enabling level to an enabling level by a flip-flop actuated by an output from a second gate when a holdoff signal from a triggered circuit applied to an input of the second gate changes from a holdoff level to a non holdoff level during the time interval when an input trigger signal from a trigger circuit, also applied to an input of the second gate, is at a non triggering level. The input trigger signal is also applied to another input of the trigger control gate and timed so that the non triggering level of such signal prevents a triggering operation by such gate during the time interval when a change of the enabling signal to its enabling level can be delivered to such gate. The timing of the application of input triggering signal to the trigger control gate is such that a change of such signal to a triggering level occurs only after the time interval referred to. The triggering operation of the trigger control gate causes the flip-flop to be reset to change the enabling signal back to its original level and also resets another flip-flop to produce the output signal, the second flip-flop having been previously set by the holdoff signal.

3,725,793
CLOCK SYNCHRONIZATION ARRANGEMENT EMPLOYING DELAY DEVICES

Earl Gordon Phillips, Aurora, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 15, 1971, Ser. No. 208,319
Int. Cl. H03k 1/00
U.S. Cl. 328—63 **9 Claims**

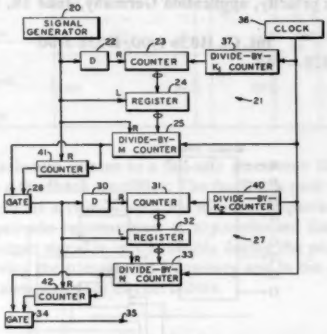


An arrangement for synchronizing the clocks of a plurality of subsystems is disclosed. The arrangement comprises a pulse generator for applying a series of basic clock pulses to local clock circuits in the several subsystems and a circuit which periodically blocks one pulse of the series of basic clock pulses. A detection circuit in each subsystem reinitializes the local clock circuit of the subsystem when the absence of one of the basic clock pulses is detected.

3,725,794
INTERPOLATING APPARATUS

Robert W. Asplund, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Feb. 7, 1972, Ser. No. 224,192
Int. Cl. H03k 5/00; G01r 29/00
U.S. Cl. 328—129 **14 Claims**

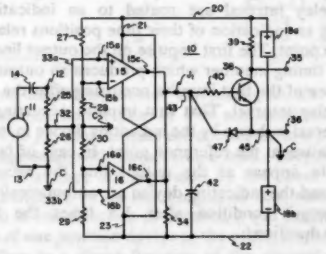


Interpolating apparatus for dividing time intervals of variable duration into an integral number of subintervals is shown wherein the time intervals are divided into a first predetermined number of subintervals each of which are further divided into a second predetermined number of subintervals.

3,725,795
A-C VOLTAGE DETECTOR

Lee O. Mesenhimer, Avon, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed Dec. 22, 1971, Ser. No. 210,718
Int. Cl. H03k 5/20
U.S. Cl. 328—135 **12 Claims**



A circuit for indicating the presence or absence of an a-c voltage. A comparator assumes a first state when an a-c voltage applied thereto is outside a predetermined range of threshold voltages and assumes a second state when the a-c voltage is within that range of voltages. An output voltage control circuit establishes a first output voltage, to indicate the presence of an a-c input voltage, when the comparator is in its first state and establishes a second output voltage, to indicate the absence of an a-c voltage, when the comparator is in its second state. Circuitry is provided to introduce a time-delay between the time that the comparator assumes its second state and the time that the output voltage control circuit establishes the second value of output voltage. The latter time-delay is arranged to be short enough to allow the voltage detector to

rapidly indicate actual interruptions in the a-c input voltage but long enough to prevent the voltage detector from indicating an a-c voltage interruption merely because the a-c voltage has varied through the above voltage range in the course of normal a-c voltage variations.

3,725,796

PROCESS FOR THE MEASUREMENT OF THE DISTORTION IN TRANSMISSION SYSTEMS WHICH TRANSMIT DATA IN PARALLEL BIT CODED FORM

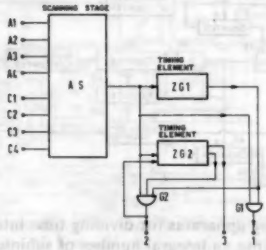
Erwin Schenk, and Kurt Biedermann, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 9, 1971, Ser. No. 151,428

Claims priority, application Germany, June 10, 1970, P 20 28 655.9

Int. Cl. H03b *1/00*; H03k *5/00*

U.S. Cl. 328—163 **6 Claims**



A process for the measurement of distortion in systems which employ parallel transmission of binary data is described. A first impulse edge appearing on one of the parallel output lines fixes a reference point and actuates a first timing member. The first timing member subsequently emits an impulse after an interval corresponding to 1.5 times the theoretical character duration has elapsed. The output of the first timing member is used as a scanning mark. All of the impulse edges arising on the output lines during the aforementioned delay interval are routed to an indicating device producing an indication of their time positions relative to the reference point. The first impulse on the output lines actuates a second timing member which produces an output upon the appearance of the first impulse occurring after the aforementioned delay interval. That first impulse occurring after the delay interval is shown by the indicating device in its time condition relative to the reference point. In case of failure of an impulse to appear at the output line the second timing member and the indicating device are automatically switched to an output condition after 1.5 times the theoretical character duration.

3,725,797

METHOD AND APPARATUS FOR FORMING A BEAM OF CHARGED PARTICLES

Senichi Masuda, 1-40-10-605 Nishigahara, Kita, Japan

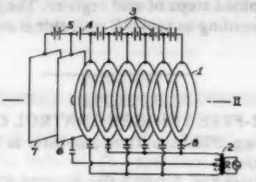
Filed April 23, 1971, Ser. No. 136,967

Claims priority, application Japan, April 28, 1970, 45/36500

Int. Cl. H01j *29/58*

U.S. Cl. 328—228 **11 Claims**

Charged particles are concentrated and held in space by means of an unequal, alternating electric field and the resulting beam of particles is directed through a hole in a plate electrode to a target electrode. A gate electrode adjacent the plate electrode may be operated selectively to oppose and enable



the passage of the concentrated beam of charged particles to the target.

3,725,798

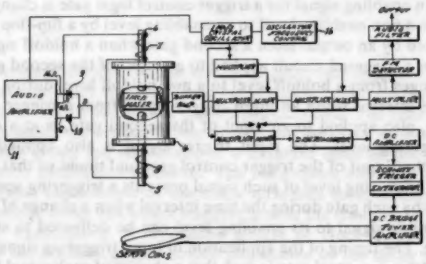
PROTON MASER ANTENNA TUNING MEANS

Jonathan C. Webster; Earl L. Sloan, III, both of Ridgesfield, Conn., and Alexander Ganssen, Munich, Germany, assignors to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 3, 1971, Ser. No. 177,751

Int. Cl. H01s *1/02*

U.S. Cl. 330—4 **3 Claims**



Tuning means capable of extending the low frequency sensitivity of a proton maser antenna to higher frequencies are realized by magnetically chopping the effective permeability of the maser antenna magnet at the local oscillator frequency. This effectively chops the received signal at the local oscillator rate and translates it to the fixed system frequency f_{IF}. The system electronics are tuned to receive only the maser sidebands corresponding to f_{IF}, and tuning is accomplished by varying the local oscillator frequency.

3,725,799

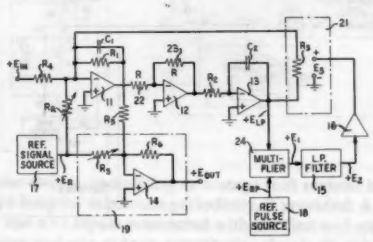
POLE FREQUENCY STABILIZED ACTIVE RC FILTER

Richard James Cubbison, Jr., Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Jan. 12, 1972, Ser. No. 217,169

Int. Cl. H01p *1/32*

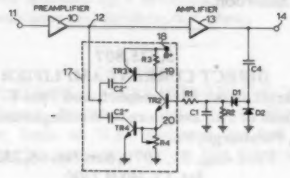
U.S. Cl. 330—21 **12 Claims**



In an active RC filter exhibiting a predetermined signal transfer characteristic, a reference signal is applied to the

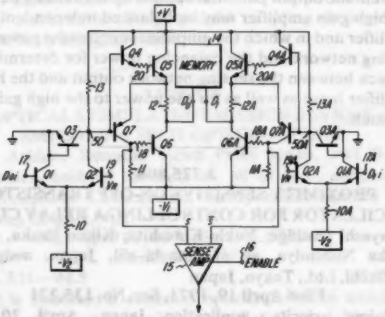
input of the filter and examined for phase shift at the low-pass signal output of the filter. A signal proportional to the variation in phase of the reference signal is used to alter a voltage controlled resistor, which in turn varies the pole frequency of the filter. The reference signal is cancelled from the signal appearing at the bandpass output of the filter to remove it from the final desired output of the filter.

3,725,800
AGC NETWORK
Joseph Papay, Kitchener, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada
Filed Sept. 7, 1971, Ser. No. 178,031
Int. Cl. H03g 3/30
U.S. Cl. 330—29 **6 Claims**



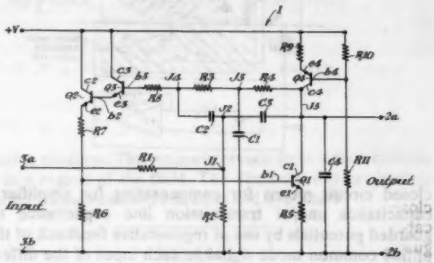
An AGC network connected between the input and output terminals of an amplifier avoids distortion and yet permits the preamplifier to provide a high level output signal. A part of the output signal of the amplifier is rectified, filtered and applied to a transistor to develop in its output circuit two D.C. signals that are applied to the base-emitter junctions of two transistors of opposite conductivity types that shunt the input terminal of the amplifier.

3,725,801
VOLTAGE DRIVER CIRCUIT
Howard Raymond Beelitz, Princeton, N.J., assignor to RCA Corporation
Filed April 5, 1971, Ser. No. 130,963
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D **8 Claims**



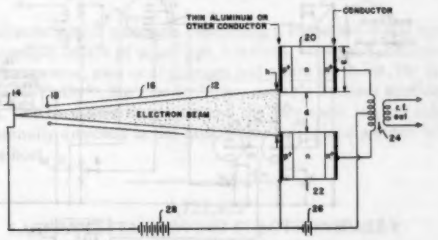
A voltage driver circuit which may be utilized as an input circuit to a sense amplifier and which operates as a voltage level shifting circuit to permit interconnection of different types of circuit technology.

3,725,802
FAIL-SAFE ELECTRONIC BAND-PASS FILTER
John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed April 9, 1970, Ser. No. 27,089
Int. Cl. H03f 3/04
U.S. Cl. 330—31 **17 Claims**



This disclosure relates to a fail-safe electronic filter circuit including a feedback amplifier. The feedback path of the amplifier includes a twin-T network which is imperfectly nulled to only provide regeneration at a preselected frequency so that an output signal is only available during the presence of a signal having the preselected frequency and in the absence of a critical component or circuit failure.

3,725,803
HYBRID ELECTRON-BEAM, SEMICONDUCTOR-DIODE AMPLIFYING DEVICE
Max N. Yoder, 6512 Truman Lane, Falls Church, Va.
Filed Jan. 25, 1972, Ser. No. 220,672
Int. Cl. H03f 3/04
U.S. Cl. 330—46 **2 Claims**

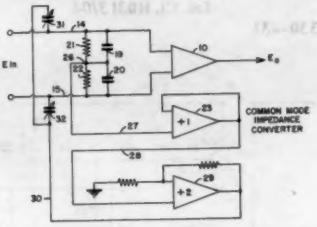


A hybrid amplifying device comprising an electron-beam-forming device and a pair of P-N semiconductor junction devices. The junction devices are connected in a pushpull circuit arrangement with respect to a load. They are also arranged so that they are separated by the beam width. The beam is deflected by an input signal so that with increasing deflection in one direction or another, it will irradiate increasing areas of one junction device or the other, respectively. The current flow is a direct function of the amount of area irradiated by the beam and the amplification is therefore linear.

3,725,804
CAPACITANCE COMPENSATION CIRCUIT FOR DIFFERENTIAL AMPLIFIER
Marion J. Langan, Huntsville, Ala., assignor to Avco Corporation, Huntsville, Ala.
Filed Nov. 26, 1971, Ser. No. 202,442
Int. Cl. H03f 3/68
U.S. Cl. 330—69 **1 Claim**

A differential amplifier is often used as a signal conditioner for low level transducer pick-ups. In many such applications the differential amplifier is remotely located with respect to

the transducer. If there is amplifier input capacitance, or capacitance from either transmission line to any potential other than that of a driven guard, differential error signals may be derived from common mode potentials. There is here disclosed circuit means for compensating for amplifier input capacitance and/or transmission line capacitance to unguarded potentials by use of regenerative feedback of the amplified common mode signal to each input of the differential amplifier.



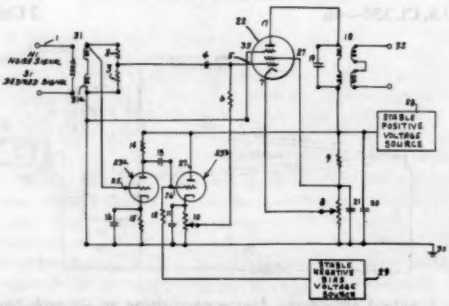
ERRATUM

For Class 330—124 see:
Patent No. 3,725,818

3,725,805
INFORMATION ENHANCING AMPLIFIER

Laurence E. Orne, 4 Erbar Circle, Billerica, Mass.

Filed June 7, 1972, Ser. No. 260,647
Int. Cl. H03f 3/00
U.S. Cl. 330—136 3 Claims



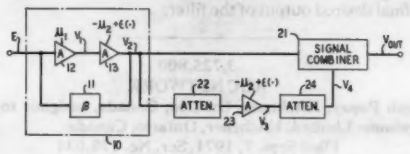
An information enhancing amplifier for insertion in a communication system. The amplifier includes a dual input signal representative of information. The input signal also includes noise. One circuit cathode detects the modulation substantially to the exclusion of the noise. The detected signal is applied to control the amplification of the other circuit to provide an output signal representative of virtually the information only.

3,725,806
DISTORTION REDUCTION IN A REPEATERED TRANSMISSION SYSTEM

Sidney Darlington, Durham, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 9, 1972, Ser. No. 261,519
Int. Cl. H03f 1/26
U.S. Cl. 330—149 11 Claims

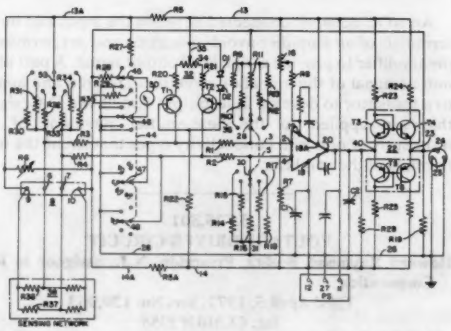
The distortion appearing at the output of a repeater having a non-linear power amplifier with local feedback as an input amplifier stage is substantially reduced by generating a compensating distortion component within an auxiliary network. The auxiliary network attenuates a signal derived from the input amplifier stage and amplifies the attenuated signal with an auxiliary amplifier having substantially the same gain and distortion characteristics as the power amplifier in the input stage. The output of the auxiliary amplifier is attenuated and combined with the output of the input stage to substantially reduce the distortion.



3,725,807
DIRECT CURRENT AMPLIFIER

Walter V. Bratkowski, McKeesport, and Paul F. Pittman, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1970, Ser. No. 68,223
Int. Cl. H03f 1/00
U.S. Cl. 330—185 13 Claims



A self-contained direct current amplifier for a sensing network wherein the high gain amplifier may be balanced independently of the sensing network feeding the amplifier and wherein the output potential applied by the sensing network to the high gain amplifier may be balanced independently of the amplifier and in which the amplifier supplies the power for the sensing network and the balancing power for determining the balance between the sensing network output and the high gain amplifier input as well as for the power to the high gain amplifier itself.

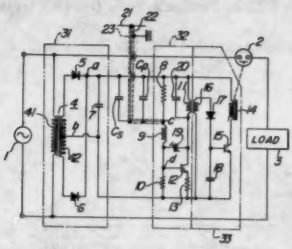
3,725,808
PROXIMITY SENSITIVE ON-OFF TRANSISTOR OSCILLATOR FOR CONTROLLING A RELAY CIRCUIT

Takayoshi Oushige; Yukio Kinoshita; Kikuo Iizuka, and Yutaka Nishimiya, all of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed April 19, 1971, Ser. No. 135,221
Claims priority, application Japan, April 20, 1970, 45/38940
Int. Cl. H01h 47/32; H03b 5/12
U.S. Cl. 331—65 2 Claims

A proximity sensitive on-off transistor oscillator becomes operative with the approach of a human body towards its detection plate, and includes back-coupled oscillation coils, an

oscillating transistor, a negative feedback controlling capacitor connected between the collector and base of the transistor



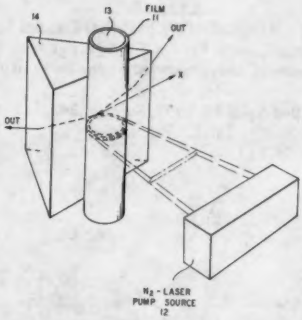
and a lead wire shielded by a shielding wire and connected between the oscillator and the detection plate.

3,725,809

DIELECTRIC RING LASERS USING WAVEGUIDING

Reinhard Ulrich, Matawan, and Heinz Paul Weber, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 5, 1971, Ser. No. 131,296
Int. Cl. H01s *3/00*; G02b *5/14*
U.S. Cl. 331—94.5 **4 Claims**



There is disclosed a ring laser in which mode-controllable oscillations occur in a dye-doped dielectric film along an axis wrapped around a lower-index dielectric. Output coupling is typically achieved by fringing field coupling to a nearby dielectric body of higher index.

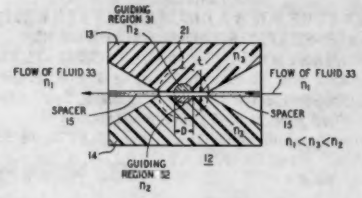
3,725,810

OPTICAL STIMULATED EMISSION DEVICES EMPLOYING SPLIT OPTICAL GUIDES

Arthur Ashkin, Rumson; Erich Peter Ippen, and Rudolf Kompfner, both of Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 23, 1971, Ser. No. 136,831
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **15 Claims**

There is disclosed a coherent optical device in which the stimulated emission of coherent radiation is achieved by monochromatic light launched into a split guiding structure which includes a fluid active medium. Typically, the active fluid flows transverse to the axis of the guiding structure through split solid members thereof spaced apart in the order of a wavelength of the light. In one embodiment of the invention, the solid members have guiding regions with higher indices of refraction than the fluid active medium. The monochromatic light propagates in and along these regions; and its fringing field pumps the fluid. In a second embodiment, the solid members have lower indices of refraction than the



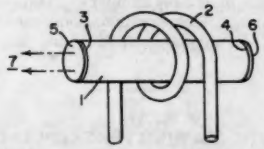
fluid active medium. The monochromatic light is then concentrated in a region of the fluid. The disclosed devices include stimulated Raman-emission devices and dye lasers.

3,725,811

LASER AND FLUORESCENT CRYSTALLINE MATERIALS

Joseph Murphy, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 474,591, July 26, 1965. This application Sept. 15, 1969, Ser. No. 866,413
Int. Cl. H01s *3/16*
U.S. Cl. 331—94.5 **16 Claims**



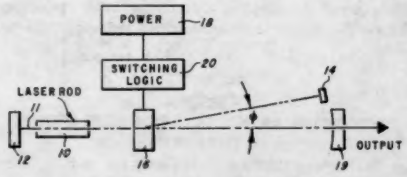
Refractory host materials containing a transition metal ion, for example an ion of scandium, titanium, vanadium, chromium, manganese, iron or chromium and a rare earth ion, for example Nd^{3+}, Dy^{3+}, Ho^{3+} or Sm^{3+}, are suitable for laser applications. The transition metal ion and the rare earth ion are substitutionally disposed in the host lattice to replace a metal ion of the host.

3,725,812

LASER SYSTEM MOVING ELECTRONICALLY SELECTABLE GAIN

Warner C. Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 26, 1971, Ser. No. 147,049
Int. Cl. H01s *3/11*
U.S. Cl. 331—94.5 **14 Claims**



A laser system for selectively producing, in response to electronic signals, laser pulses at random intervals and of preselected and variable energy, including a laser cavity capable of being electronically controlled to effect a selectively variable gain. An acousto-optic deflector is disposed in the laser cavity and the amount of acoustic energy applied to the deflector controls the amount of radiation feedback to the

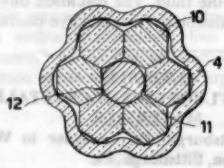
laser rod and thus controls the Q or gain of the laser system to any of a wide range of selectable values.

3,725,813

GAS LASER TUBE WITH A DISCHARGE PATH DEFINED BY ROD-SHAPED MEMBERS MADE OF ION BOMBARDMENT RESISTIVE INSULATOR MATERIAL

Susumu Yasuda, and Norio Sato, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 21, 1971, Ser. No. 154,894
Claims priority, application Japan, June 25, 1970, 45/55717
Int. Cl. H01s *3/02, 3/22*
U.S. Cl. 331—94.5 **6 Claims**



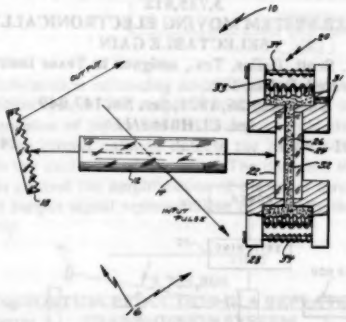
A gas laser tube comprising a discharge path defined by a plurality of rod-shaped members made of an insulator material that is capable of withstanding ion bombardment. The rod-shaped members are preferably circular or hexagonal in cross-section, and are in tight contact with one another and with the inside surface of the tubular portion of the laser tube envelope.

3,725,814

APPARATUS FOR LOCKING THE FREQUENCY OF A LASER TO AN ATOMIC ABSORPTION LINE

Howard Schlossberg, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 10, 1971, Ser. No. 179,383
Int. Cl. H01s *3/08*
U.S. Cl. 331—94.5 **6 Claims**



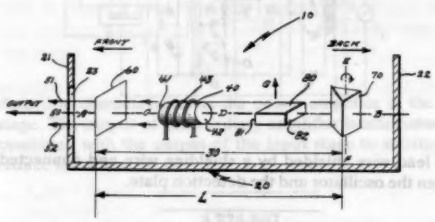
An apparatus made up of a laser and a compound optical resonator which locks the frequency of the laser to the atomic absorption line of a gas having a narrow absorption line and which is placed within the compound resonator. The gas sufficiently destroys the interference effects of the resonator thereby lowering the loss of the resonator to a value for which the laser will oscillate. This oscillation frequency is thus locked to the frequency of the absorption line of the gas.

3,725,815

PHOTOELASTIC MODE-LOCKING OF Q-SWITCHED LASERS USING BIREFRINGENT CRYSTALS

Edward S. Cassedy, Jr., 6 Hampshire Road, Great Neck, N.Y., and Martin Piltch, Postfach 968, D-3400 Gottingen, Germany

Filed Jan. 10, 1972, Ser. No. 216,514
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 **6 Claims**



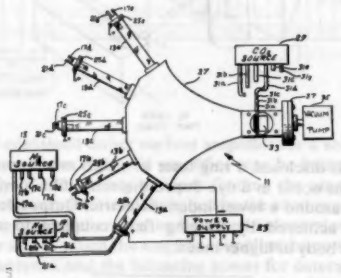
Apparatus for, and a method of, achieving mode-locked operation in a Q-switched laser by using a transparent, photoelastic, uniaxial birefringent crystal. Mode-locked operation is achieved by interposing the crystal within the laser resonant cavity which is of a predetermined length for use with the particular crystal. The crystal is positioned on the longitudinal axis of the laser, and between the laser medium and the Q-switch, with the optic axis of the crystal being in a plane normal to the longitudinal axis of the laser.

3,725,816

FAN GEOMETRY MIXING LASER

Dennis N. Mansell, Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed April 28, 1972, Ser. No. 248,420
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 **4 Claims**



A mixing laser is fed by a plurality of glass discharge tubes arranged in a fan configuration each tube being fed by a helium source and a nitrogen source. The nitrogen source is electrically excited by a DC power supply and sent to a vacuum mixing chamber where the gases are mixed with cold carbon dioxide through bleed bars.

3,725,817

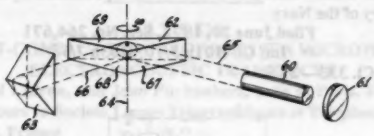
HIGH POWER LASER SYSTEM

Thomas E. Nolan, Medfield, Mass., assignor to RCA Corporation

Filed Sept. 2, 1964, Ser. No. 393,831
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **7 Claims**

Disclosed is a system for decreasing the required angular velocity of a mechanically rotated Q switch for a laser for any given speed of switching the laser cavity from a low Q switch

state thereof to a high Q state thereof. This is accomplished by incorporating means for providing a predetermined plural



number of reflections by the rotating Q switch for each single round trip of the laser beam through the cavity.

3,725,818

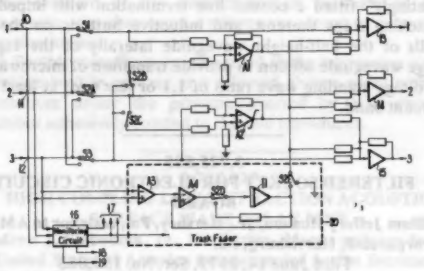
VOTER CIRCUITS FOR THREE-CHANNEL REDUNDANT SYSTEMS

Amin Mulji Nurmohamed, Gillingham, and Richard Watters, Penshurst, near Tonbridge, both of England, assignors to Elliott Brothers (London) Limited, London, England

Filed Sept. 15, 1971, Ser. No. 180,632

Int. Cl. H03f *3/68*

U.S. Cl. 330—124 D **5 Claims**



This invention relates to voter circuits for three-channel redundant systems, "synchronizing" the signals in the channels. The channel 2 signal is normally fed straight through, and is compared with the signals in channels 1 and 3 by limited authority amplifiers A1 and A2 whose outputs are added into channels 1 and 3 to bring those channel outputs into near equality with channel 2. Faults are detected by a fault detector 16, which detects when any one channel input differs by more than a preset small amount from the other two channels. For channel 1 or channel 3 faults, the input for that channel is switched to channel 2 or channel 1 respectively. For channel 2 faults, the input for that channel is switched to channel 3; additionally, a fader circuit 20 is switched in. This stores the difference between channels 2 and 3 just before the fault, adds it to the outputs, and gradually fades out this difference until the outputs are following channel 3 instead of channel 2. Transients in the outputs following a fault are thus eliminated without affecting the frequency response of the system to changes in the inputs.

3,725,819

SUPERCURRENT DEVICES WITH ENHANCED SELF-FIELD EFFECTS

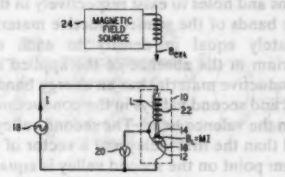
Theodore Alan Fulton, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkely Heights, N.J.

Filed July 26, 1971, Ser. No. 166,129

Int. Cl. G01r *33/02*; H03b *7/02*; H03k *3/38*

U.S. Cl. 331—107 S **9 Claims**

A supercurrent device comprising a pair of weak-link regions connected in a superconducting loop is driven by a current source. In series with the loop is an inductor for generating a magnetic field (i) proportional to the current flowing through the loop and (ii) the flux of which extends through the loop. The device, which exhibits both negative resistance and



discrete supercurrent states at zero voltage, functions in several ways including: as a negative resistance oscillator, as a memory device, or as a highly sensitive linear magnetometer.

3,725,820

PHOTOSENSITIVE SOLID OSCILLATOR

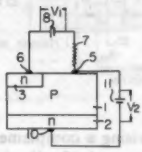
Kiyoshi Kojima, and Toshiro Abe, both of Osaka, Japan, assignors to Matsushita Denko Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 889,236, Dec. 30, 1969. This application Jan. 17, 1972, Ser. No. 218,096

Claims priority, application Japan, Jan. 5, 1969, 44/1264; Feb. 14, 1969, 44/11180; March 31, 1969, 44/25113; April 24, 1969, 44/32102; April 30, 1969, 44/33831

Int. Cl. H03b *7/06*

U.S. Cl. 331—107 R **7 Claims**



A photosensitive solid oscillator, which comprises an impurity layer formed on a surface of a semi-conductor wafer, two separate impurity layers formed one the other surface of said wafer as spaced along the surface from each other, and electrodes respectively provided at least on each of the latter two impurity layers. The respective impurity layers on both surfaces of the wafer are of a reversely conducting type semiconductor with respect to said wafer and contain an impurity of higher concentration than in the wafer.

3,725,821

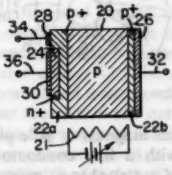
SEMICONDUCTOR NEGATIVE RESISTANCE DEVICE

Shigeru Mitsui, c/o Kitaitami Works of Mitsubishi Denki kabushiki Kaisha, No. 1, Aza Zugaike, Ojika, Itami, Hyogo Prefecture, Japan

Continuation-in-part of Ser. No. 879,249, Nov. 24, 1969, abandoned. This application May 17, 1972, Ser. No. 254,239

Int. Cl. H03b *7/06*

U.S. Cl. 331—107 G **25 Claims**



A method of imparting a negative resistance to a wafer of semiconductive material having applied thereacross an elec-

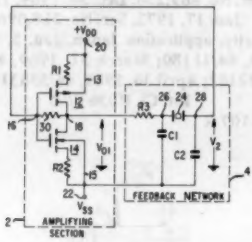
tric field of a threshold magnitude above which current flowing through the semiconductive material decreases with an increase in the applied field comprises the steps of causing both electrons and holes to exist respectively in the conduction and valence bands of the semiconductive material so as to be approximately equal in density to each other in thermal equilibrium in the absence of the applied electric field. The semiconductive material has an energy band structure including first and second valleys in the conduction band and a third valley in the valence band. The second valley is higher in energy level than the first valley and a vector of wave number at a minimum point on the second valley is equal to that at a maximum point on the third valley in the valence band.

3,725,822

PHASE SHIFT OSCILLATORS USING INSULATED-GATE FIELD-EFFECT TRANSISTORS

Sargent Sheffield Eaton, Jr., Phillipsburg, N.J., assignor to RCA Corporation, Somerville, N.J.

Filed May 20, 1971, Ser. No. 145,407
Int. Cl. H03b *5/24, 5/36*
U.S. Cl. 331—108 B **7 Claims**



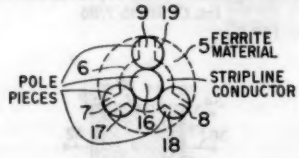
An oscillator comprising a complementary symmetry field effect transistor inverter, and a feedback loop from the output terminal to the input terminal of the inverter. Frequency stabilization is achieved by connecting the source electrode of each transistor through a resistor to the respective power supply terminals for these transistors and the two substrates directly to the respective power supply terminals.

3,725,823

STRIPLINE CIRCULATOR BIASED BY A PLURALITY OF SMALL POLE PIECES

Tari Miura, Tokyo; Kiichi Nakamura, and Tadashi Hashimoto, both of Ichikawa, all of Japan, assignors to T.D.K. Electronics Company, Ltd., Tokyo, Japan

Filed June 18, 1971, Ser. No. 154,422
Claims priority, application Japan, June 30, 1970, 45/57578
Int. Cl. H01p *1/32, 5/12*
U.S. Cl. 333—1.1 **3 Claims**



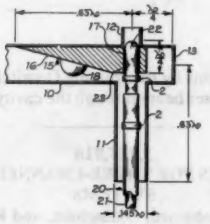
A plurality of small magnets or pole pieces are disposed in opposed relation with a line conductor vacuum-deposited upon one surface of a disk-shaped magnetic medium so that the external magnetic field may be vertically applied to the line conductor. The frequency band characteristic as well as the backward loss characteristic may be improved.

3,725,824

COMPACT WAVEGUIDE-COAX TRANSITION

Oakley McDonald Woodward, Princeton, N.J., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 20, 1972, Ser. No. 264,671
Int. Cl. H01p *5/10;* **H03h** *7/38*
U.S. Cl. 333—21 R **8 Claims**



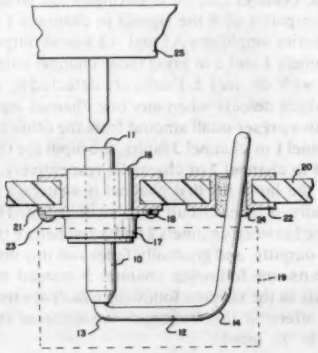
A compact waveguide-to-coaxial transition coupling having a half-height waveguide with a shorted termination and with a tapered ridge waveguide section having a port therein one-quarter wavelength from the termination into which port is "floatingly" fitted a coaxial line termination with impedance matching steps thereon, and inductive buttons on the side walls of the half-height waveguide laterally of the tapered ridge waveguide section to provide transition of microwave at a voltage standing wave ratio of 1.1 or less over at least a 13 percent band.

3,725,825

FILTERED SOCKET FOR ELECTRONIC CIRCUIT BOARD

William Jeffery Hudson, Jr., Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 14, 1971, Ser. No. 152,883
Int. Cl. H01h *7/14*
U.S. Cl. 333—79 **8 Claims**



A filtered socket decouples the pin of an electronic circuit device such as a transistor or a thin film amplifier. The tubular socket is constructed of a resilient metal with a pin receiving opening at one end and a resilient tail at the other end. A tubular filter is soldered onto the socket. This filter has a metal flange which is positioned against the plated through circuit in a hole on the circuit board. The filtered socket is locked to the board by resiliently positioning the tail in another hole in the circuit board. The board is flow soldered to establish an electrical connection between the outer conductive surface of the filter and a common electronic connection extending to the hole in which the socket is positioned. Another electrical connection is established between the circuit extending to the

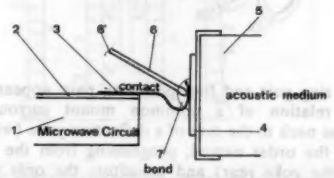
other hole and the socket itself. A solder-free plastic coating on a portion of the filter and a portion of the tail prevents solder from bridging the two holes.

3,725,826

POINT-CONTACT-ELECTRODE DRIVEN MICROWAVE ELECTROACOUSTIC TRANSDUCER

Bernard Chiron, and Jean Puyhaubert, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed June 14, 1971, Ser. No. 152,670
Int. Cl. H03h 9/30; H04r 17/00
U.S. Cl. 333—30 R **3 Claims**



Improvement of the interconnection between an electroacoustic transducer and a microwave circuit to reduce the insertion losses.

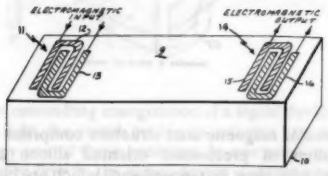
A flexible metallic strip connected to the microwave circuit is maintained in contact at a selected chosen point with the transducer under the pressure exerted by a mechanical member adhesively bonded to the said transducer.

3,725,827

HIGH COUPLING LOW DIFFRACTION ACOUSTIC SURFACE WAVE DELAY LINE

Andrew J. Slobodnik, Jr., Burlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed May 17, 1972, Ser. No. 254,121
Int. Cl. H03h 7/30
U.S. Cl. 333—30 **3 Claims**



An acoustic surface wave delay line having a lithium niobate substrate member the surface wave propagation plane of which is parallel to the lithium niobate crystalline X axis and intersects the crystalline Z and -Y axes. Optimum results are obtained when the intersecting angle of the propagation plane and the Z axis is in the vicinity of 16.5°.

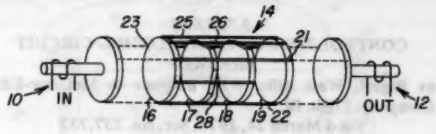
3,725,828

ASYMMETRICAL LOSS-POLE MECHANICAL FILTER

Gabor C. Temes, Los Angeles, Calif., assignor to Collins Radio Company, Dallas, Tex.

Filed March 13, 1972, Ser. No. 234,182
Int. Cl. H03h 9/26
U.S. Cl. 333—71 **6 Claims**

An electromechanical filter of disc type in which the frequency response for a given passband may be varied to achieve a desired characteristic by appropriately shifting loss-poles. The filter includes at least one four-disc resonant section including first coupling wire means attached to the peripheries of each of said discs, second coupling wire means attached to the first and fourth discs and bridging the second and third discs, and third coupling wire means attached to the



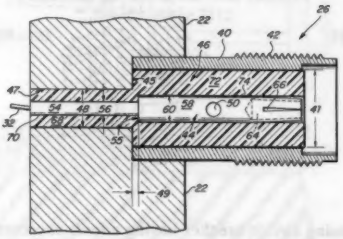
first and third discs and bridging the second disc. A fourth coupling wire means may be attached to the second and fourth discs and bridging the third disc.

3,725,829

ELECTRICAL CONNECTOR

Deane David Brown, Mountain View, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed July 14, 1971, Ser. No. 162,432
Int. Cl. H01p 3/00, 3/08
U.S. Cl. 333—84 M **10 Claims**



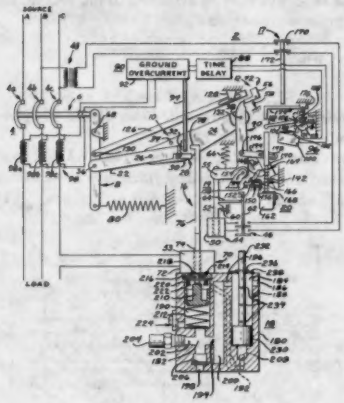
An electrical connector for transferring electromagnetic energy between a coaxial cable and a microstrip transmission system, each having a characteristic impedance of 50 ohms, with a minimal power loss due to a reflective discontinuity during the transfer. The electrical connector includes a central conductor and an outer conductor enclosing the central conductor, and has first, second, and transition sections each of which is designed to have a characteristics impedance of 50 ohms. The first and second sections are designed like sections of a coaxial cable to have a characteristic impedance of 50 ohms by the proper selection of the ratio of the diameters of the central and outer conductors. The central conductor of the first section has a small diameter, and the diameter of the outer conductor is a selected multiple of the small diameter to yield a characteristic impedance of 50 ohms. The second section has a large diameter central conductor, and the diameter of the outer conductor is the same selected multiple of the large diameter to yield a characteristic impedance of 50 ohms. The central conductor has an abrupt shoulder like transition between the small ad large diameters of the first and second sections. Similarly, the outer conductor has an abrupt shoulder like transition between the small and large diameters of the first and second sections. The transition section of the connector joins the first and second sections, and is constructed to have a short length of the small diameter of the central conductor enclosed within a short length of the large diameter of the outer conductor. The abrupt shoulder like transitions of the central and outer conductors define a large surface area between the central and outer conductors over a short conductive path. This large surface area introduces a significant capacitive reactance which is compensated for by positioning the short length of the small diameter central conductor in the large diameter outer conductor. This relative positioning introduces a significant inductive reactance into the transition section to compensate for the significant capaci-

tive reactance introduced by the large surface area, and results in a characteristic impedance of 50 ohms in the transition section.

3,725,830
CONTROL MEANS FOR RECLOSING CIRCUIT BREAKER

Max Rigert, West Allis, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed March 24, 1972, Ser. No. 237,732
Int. Cl. H01h *81/04*
U.S. Cl. 335—32 **12 Claims**



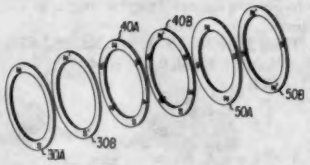
A reclosing circuit breaker having a fault overcurrent time delay means and an operation counting means. The opening time delay means selectively permits one or more fast opening operations and then, in response to a pumping force by a spring charged during a previous opening operation, blocks an oil exhaust port so that subsequent opening operations are time delayed. The operation counting means is advanced a predetermined step distance for each opening operation of the circuit breaker and is held in each advanced step until just before reclosing of the circuit breaker. The step distance advanced and the point at which the counting means is released is controlled, in part, by a simple adjustment device. Depending on its initial setting, the counting means will permit a predetermined number of circuit breaker opening operations and then will actuate a means for locking open the circuit breaker.

3,725,831
MAGNETIC BEAM ADJUSTING ARRANGEMENTS

Robert Lloyd Barbin, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 14, 1972, Ser. No. 217,757
Int. Cl. H01f *7/00*
U.S. Cl. 335—212 **8 Claims**

A pair of four-pole magnet rings, each mounted for independent, concentric rotational adjustment about the neck of an in-line, tri-beam shadow-mask color kinescope, constitute a facility for introducing mutually opposing shifts of the outer beams of the in-line trio in any desired direction, without substantially affecting the central, axial beam, and without requiring internal pole piece structures for field directing purposes. A pair of 6-pole magnet rings, each mounted for independent, concentric rotational adjustment about an adjacent region of the color kinescope neck, constitute an additional facility for introducing like-direction shifts of the outer beams of the in-line trio in any desired direction, without substantially affecting the central beam, and without requiring internal pole piece structures for field directing purposes. The two magnet ring pairs together provide an arrangement for effecting static convergence of the beam trio at the kinescope screen. A third pair of two-pole magnet rings, similarly subject to rotational adjustment about the kinescope neck, provide means for introducing like-direction shifts of all three beams in any desired direction for conventional purity adjustment purposes. In a preferred application of the invention, the two-pole ring pair,

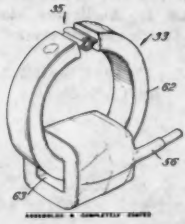


six-pole ring pair and four-pole ring pair, appear in axially spaced relation of a common mount surrounding the kinescope neck to the rear of a deflection yoke (with the ring pairs in the order named, progressing from the neck base toward the yoke rear) and constitute the only neck components (exclusive of the deflection yoke) required in set-up and operation of the color kinescope.

3,725,832
MAGNETIC CORE STRUCTURE

Edmund O. Schweitzer, Jr., Northbrook, Ill., assignor to E. O. Schwertzer Manufacturing Co., Inc., Mundelein, Ill.

Continuation-in-part of Ser. No. 55,532, July 16, 1970, abandoned. This application Oct. 12, 1971, Ser. No. 188,034
Int. Cl. H01f *27/24*
U.S. Cl. 336—96 **9 Claims**



A circular magnetic core structure comprises a plurality of laminations of prestressed oriented silicon steel secured together near their juxtaposed ends which are biased into mutual engagement and are separable to receive an alternating current carrying conductor to induce into the core alternating magnetic flux which induces alternating current into a coil on the core corresponding to the current in the conductor. The core and coil are encapsulated in insulating material. In one embodiment self curing cement is applied to the juxtaposed ends after the core is applied to the conductor to seal them together. In another embodiment the ends are provided with interlocking separable coupling extensions of corrosion resisting magnetic material.

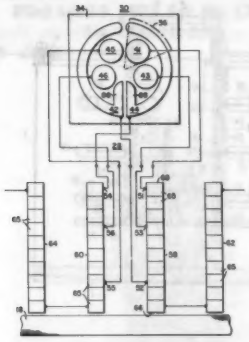
3,725,833
TRANSFORMER TAP SELECTOR

Michael W. Thomas, Muncie, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 28, 1972, Ser. No. 248,474
Int. Cl. H01f *21/12*
U.S. Cl. 336—146 **6 Claims**

Tap selecting means providing minimum flux symmetry destruction at different tap settings. The tap selecting means

includes movable and stationary contacts connected to tap terminals on coils of the transformer winding structure. The

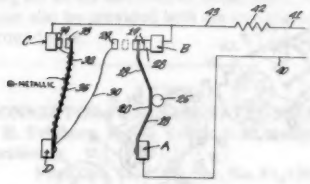


contacts and the tap connections are arranged to provide maximum tapout in one coil before tapping-out another coil.

3,725,834
ELECTRIC SWITCHES

Robert L. Dorsey, Sr., 6550 Mahoning Ave., N.W., Warren, Ohio; James C. Gross, 140 Champion West, and H. George Myers, 327 Willard, S.E., both of Warren, Ohio

Filed Oct. 27, 1971, Ser. No. 192,911
Int. Cl. H01h *37/72*
U.S. Cl. 337—44 **9 Claims**



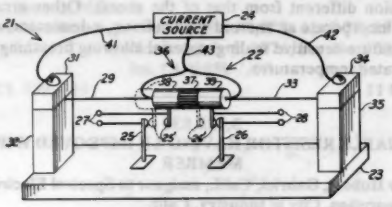
A switch for controlling energization of a signal device, such as an electric light, the switch having an actuator arm which is movable to any one of three positions. In one position of the actuator, current flow to the signal device is interrupted; in a second position of the actuator, uninterrupted current flows to the signal device so that the latter is energized in a steady manner; and in a third position of the actuator, current flows intermittently to the signal device so that the latter may act as an emergency indicator.

3,725,835
MEMORY MATERIAL ACTUATOR DEVICES

John B. Hopkins, 295 Harvard St., Cambridge, Mass., and Wilhelm Rindner, 6 Tyler Road, Lexington, Mass.

Filed July 20, 1970, Ser. No. 56,459
Int. Cl. H01h *61/06*
U.S. Cl. 337—140 **13 Claims**

Disclosed are actuator devices employing "memory material" actuator and reset elements that deform from a set shape toward an original shape when subjected to a critical temperature level after having been initially deformed from the original shape into the set shape while at a lower temperature. The actuator and reset elements are mechanically coupled such that temperature-induced deformation of one into its original shape effects mechanical deformation of the other into its set shape. By selectively and alternately applying heat

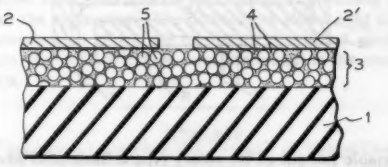


internally to the actuator and reset elements reversible output motion is provided for a wide variety of output functions.

3,725,836
THICK FILM VARISTOR AND METHOD FOR MAKING THE SAME

Mitsuo Wada, Kazuyuki Nishimoto; Masaki Aoki, and Yoshio Iida, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed May 25, 1971, Ser. No. 146,624
Int. Cl. H01c *7/12*
U.S. Cl. 338—21 **14 Claims**

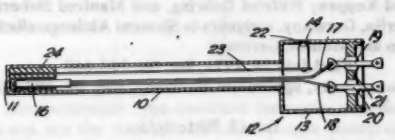


A thick film varistor having a thick film of finely divided particles of zinc oxide dispersed in a glass frit which bonds the particles together. Electrodes are provided on the thick film. The varistor is made by preparing a paste of the zinc oxide particles, the frit, and a liquid vehicle, and applying the paste to an insulating base. The paste is heated to evaporate the liquid vehicle and then melt the particles of frit to bond the particles of zinc oxide together. Thereafter the electrodes are applied. Alternatively, one electrode can be applied to the insulating base, the thick film formed thereon, and a second electrode applied to the surface of the thick film.

3,725,837
PLATINUM RESISTANCE TEMPERATURE SENSORS

Harry Fullager, Bognor Regis, England, assignor to Rosemount Engineering Company Limited, Bognor Regis, England

Filed Sept. 13, 1971, Ser. No. 179,669
Int. Cl. H01c *7/00*
U.S. Cl. 338—28 **14 Claims**



Platinum resistance thermometers with means for preventing ingress of moisture from the atmosphere at temperatures below 100°C., and preferably below 150°C., and for relieving the rise in pressure within the thermometer as the thermometer is heated. In one arrangement the thermometer has a metal sheath sealed apart from a vent and a closure member is pro-

vided on the free end of a bimetallic strip. In another arrangement, the closure member is carried on the end of a tube mounted within the metal sheath and having a coefficient of expansion different from that of the sheath. Other arrangements incorporate an aneroid-type bellows, a dessicator, and a temperature-sensitive sealing material allowing breathing only at elevated temperatures.

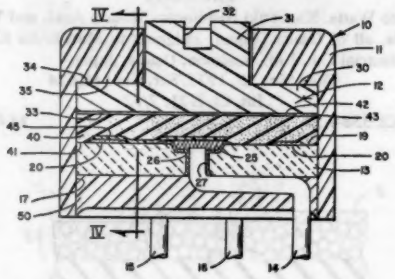
3,725,838
VARIABLE RESISTOR HAVING AN IMPROVED WIPER MEMBER

Gustav Hubert, Gabriel, Calif., assignor to Spectrol Electronics Corporation, City of Industry, Calif.

Continuation-in-part of Ser. No. 118,750, Feb. 25, 1971, Pat. No. 3,652,970. This application Dec. 14, 1971, Ser. No. 207,753. The portion of the term of this patent subsequent to March 28, 1989, has been disclaimed.

Int. Cl. H01c 1/12

U.S. Cl. 338—174 **3 Claims**



A variable resistor of the rotary type is illustrated having a rotatable wiper member, a substrate member carrying an arcuate resistance element and a collector element, all coaxially secured in a cylindrical housing. The wiper member comprises a relatively rigid carriage element having a screw driver slot therein for rotating the wiper member from the exterior of the housing. A resilient pad element is adhesively secured to the carriage element. A flexible contact element is secured to the face of the pad element facing the resistance and collector elements so that the contact element makes electrical contact between the collector and the desired location on the resistance element. The spacing between the substrate member and the carriage member within the housing is less than the uncompressed thickness of the pad element so that the pad urges the contact element into firm engagement with the resistance and collector elements. A portion of the pad element forms a peripheral seal with the substrate member to prevent the passage of contaminates to the resistance element.

3,725,839
MEASURING RESISTANCE DEVICE FOR HIGH VOLTAGE

Gerhard Koppen; Wilfried Dobring, and Manfred Siebart, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

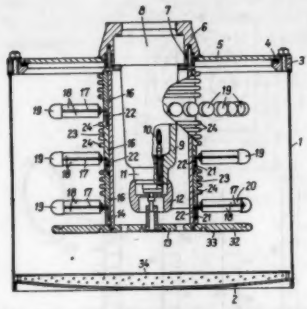
Filed July 14, 1971, Ser. No. 162,440

Claims priority, application Germany, July 24, 1970, P 20 37 907.1

Int. Cl. H01c 1/16

U.S. Cl. 338—334 **11 Claims**

A measuring resistance device for high voltage such as for measuring the accelerating voltage of particle-beam apparatus, especially an electron microscope, has a housing fillable with a fluid insulating medium and a carrier disposed in the housing. The carrier has a plurality of disk-like carrier plates made of electrical insulating material and spacers for mutually separating the plates. The spacers and the plates are stacked to conjointly configure the carrier as columnar structure. A plurality of individual rod-like resistors are serially connected



together and grouped into a plurality of sets, each of the sets being arranged on a corresponding one of the plates.

3,725,840
ELECTRICAL PLUG AND SOCKET COUPLING FOR CONNECTING ELECTRICAL LEADS

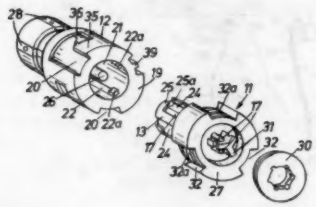
Kurt Hesse, Lemgo-Lippe, Germany, assignor to Staff & Schwarz G.m.b.H, Lemgo-Lippe, Germany

Filed March 29, 1971, Ser. No. 128,795

Claims priority, application Austria, March 31, 1970, 2942

Int. Cl. H01r 3/06

U.S. Cl. 339—14 R **10 Claims**

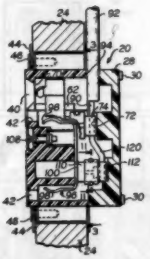


An electrical coupling for connecting electrical leads containing two coupling halves, a socket and a plug having at least two current conducting contacts and at least one protective contact each, the protective contacts being capable of being connected together before the current conducting contact is made, wherein the socket at its coupling end has an annular space enclosing a core the outer wall of which is provided with radially projecting coupling members partially projecting into the annular space, and the inner wall of which, formed by the core, is provided with longitudinal electric contacts extending in the axial direction of the plug, and set back relatively to the front of the socket at the coupling end, together with a protective or earthing contact, the plug, at the coupling end, having a coupling ring engaging in the annular space of the socket and comprising external coupling members, the inner plug space enclosing the contact base of the socket comprising elongated electrical contacts extending in the axial direction of the plug and set back relatively to the face of the plug on the coupling end, together with a protective or earthing contact, so that the coupling members of the socket and plug form a bayonet connection disposed within the socket member and secured against unintentional detachment in the coupled position.

3,725,841
WALL RECEPTACLE WITH IMPROVED CONNECTOR TERMINAL CONSTRUCTION

Daniel E. Robinson, Metuchen, and Solomon Rubinstein, Fanwood, both of N.J., assignors to General Cable Corporation, New York, N.Y.

Filed April 9, 1971, Ser. No. 132,723
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 11 Claims

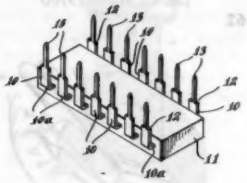


This improved wall receptacle has a housing with slots in the front wall for receiving the prongs of electrical cord fittings and has terminals in the housing held in depressions of the housing and in position to contact with the prongs that are inserted through the slots. These terminals are constructed with barrels that grip conductors of a power cable and that can be secured to the cable before being inserted into the housing. In the preferred construction, the terminals are held in the housing by a back portion of the housing that is detachably connected to the portion into which the terminals fit. The construction can be made so that the power conductors require no bending for either entrance or termination. A ground connection can also be provided with the barrel clamping feature for the ground wire.

3,725,842
CONNECTOR FOR INTEGRATED PACKAGE

Leonard H. Feldberg, Spring Valley, N.Y., assignor to Burndy Corporation

Filed Oct. 16, 1970, Ser. No. 81,435
Int. Cl. H05k 1/02
U.S. Cl. 339—17 CF 16 Claims

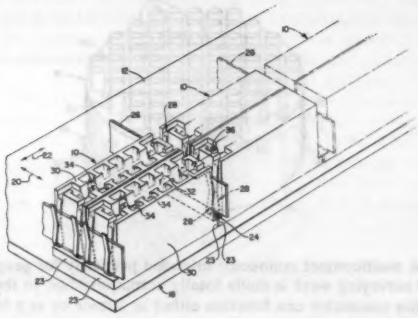


A connector is adapted to hold an integrated circuit package in assembled relation thereto and also to a plate or printed circuit board. The connector has electrodes to the ends of which are applied terminals of the integrated circuit package, the electrodes yielding to compensate for variations in the dimensions of the electrodes and terminals. Detent means may be formed on the connector to secure it to the plate or printed circuit board in position to grasp and hold the integrated circuit package.

3,725,843
BUSSING CONSTRUCTION FOR PRINTED CIRCUIT CONNECTORS

Lennart B. Johnson, Topsfield, Mass., assignor to Teradyne, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 32,570, April 28, 1970, abandoned. This application July 6, 1971, Ser. No. 159,732
Int. Cl. H05k 1/07
U.S. Cl. 339—19 11 Claims



A bussing construction for printed circuit card connectors arrayed on the front face of a panel forming a connector plane provides bus bars above the plane and extending adjacent the connector ends, with clips on the connectors mounting the bus bars to the connectors. The connectors also mount distribution conductors above the connector plane and connecting the bus bars to distribution contacts seated in the connector sockets.

3,725,844
HERMAPHRODITIC ELECTRICAL CONTACT

James E. McKeown; Stephen E. Gregoire, and Donald E. Michel, all of Sidney, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed March 15, 1971, Ser. No. 124,088
Int. Cl. H01r 13/22, 25/00
U.S. Cl. 339—49 R 20 Claims

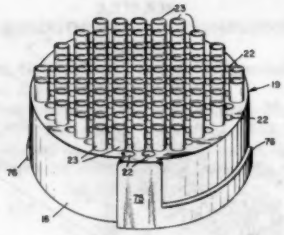
A hermaphroditic type electrical connector assembly that does not use the standard male and female connection. Instead of a single male pin, several fine wires are bundled together to form a brush contact. Similarly, the mating contact is comprised of several fine wires bundled into a brush. When the contacts are in mated relationship, the fine wires of the connector assembly are intermingled to complete the electrical circuit relationship between the mated contacts of the connector assembly.

3,725,845

ENVIRONMENT PROOF CONNECTOR

Robert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed March 30, 1971, Ser. No. 129,410
Int. Cl. H01r 13/64, 25/10
U.S. Cl. 339—49 R 3 Claims



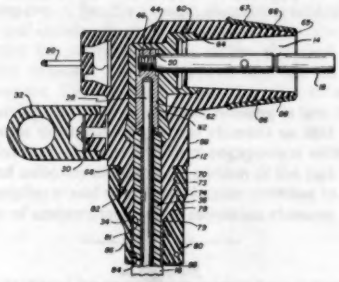
A multicontact connector intended primarily for geophysical surveying work is made totally hermaphroditic so that the entire connector can function either as a male or as a female member whereby the connector can be connected to its identical counterpart. Also disclosed is a connector insert from which hollow posts extend to individually enclose half of the contacts anchored in the insert, the posts being distributed in a pattern such that, when two such inserts are face to face and properly indexed, their respective arrays of posts clear one another.

3,725,846

WATERPROOF HIGH VOLTAGE CONNECTION APPARATUS

Robert Allen Strain, Florissant, Mo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,651
Int. Cl. H01r 11/02, 13/46
U.S. Cl. 339—61 R 4 Claims



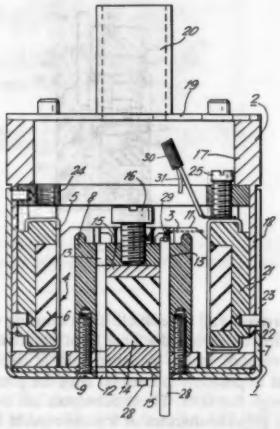
A high-voltage connector construction capable of use in submersible or exposed areas. The metallic connector itself and its connection to the conductor of a shielded cable are surrounded by a semi-conductive body of elastomeric material which engages the cable metallic connector and acts to prevent voltage differential and resulting corona within air gaps in and around the connection. A two-piece insulating housing of elastomeric material surrounds the semi-conductive body. The housing has a conductive or semi-conductive outer coating sprayed or dipped onto its outer surface, the outer surface being engaged in a sealing relation with a moisture seal, the moisture seal being fabricated of conductive or semi-conductive elastomeric material and being capable of sealing the entrance of the cable to the insulating housing and conductively engaging the cable shield.

3,725,847

ELECTRICAL CONNECTORS FOR MULTIPLE THERMOCOUPLE CONDUCTORS

Piyatilleke Perera Guneratne, Millom, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed May 4, 1971, Ser. No. 140,216
Claims priority, application Great Britain, May 19, 1970, 24,297/70
Int. Cl. H01r 13/12
U.S. Cl. 339—61 M 3 Claims



The electrical connector for multiple mineral insulated thermocouple conductors comprises a socket member having multiple contacts which present knife edges to corresponding strip contacts in a complementary plug member. The strip contacts are embraced by a resilient sleeve which urges the strips into contact with the knife edges. The knife edges penetrate any oxide film on the strip contacts and ensure good electrical connection between the contacts. The socket member has a central resilient plug which can be compressed axially to expand it radially outwardly thereby to grip the ends of mineral insulated cables entering the socket and arranged about the central plug.

3,725,848

ATTACHMENT PLUG WITH CORD GRIP

William E. Davidson, Ontario, Calif., assignor to General Electric Company, Bridgeport, Conn.

Filed June 11, 1971, Ser. No. 152,077
Int. Cl. H01r 13/60
U.S. Cl. 339—62 1 Claim

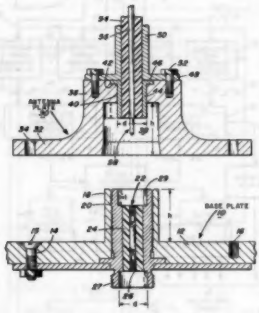
The invention is an attachment plug for an appliance or the like, the plug having an integral cord grip formed on its side and an open channel to grip a single conductor or one-half of a flat two-conductor cord to lock the plug on the cord when not in use. The grip is formed to serve a dual purpose of both clamping the cord and providing a finger gripping means to remove the plug and is so disposed that the cord remains untwisted when it is clamped by the plug.

3,725,849

PLUG IN ANTENNA, ANTENNA BASE AND TEST PROBE SYSTEM

Edward G. Becke, Camp Springs, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 23, 1970, Ser. No. 83,552
Int. Cl. H01r 17/06
U.S. Cl. 339—92 R 6 Claims



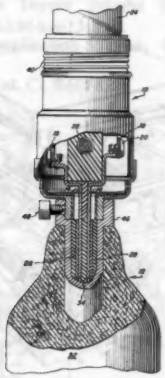
An antenna mounting system, including a base plate having a rear coaxial connector to which a coaxial cable is permanently attached. The base plate is permanently attached to the exterior of the mounting surface with the coaxial connector extending inwardly thru a hole in the mounting surface. An antenna mounting plate or a test probe fits onto the base plate. The antenna or test probe is secured to the base plate by bolts, thereby allowing for the rapid removal of the antenna and replacement thereof by the test probe.

3,725,850

DETACHABLE LAMP SOCKET ASSEMBLY

John Izumi, 105 East Ohio St., Chicago, Ill.

Filed July 6, 1971, Ser. No. 159,943
Int. Cl. H01r 13/54
U.S. Cl. 339—92 R 3 Claims



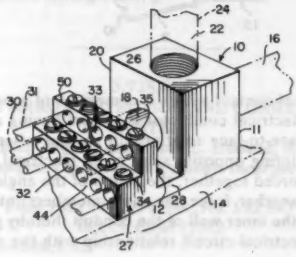
A detachable lamp socket assembly having a lamp socket for receiving a bulb, prongs extending from the bottom of the lamp socket, the prongs being connected within the socket to the bulb and lamp switch terminals, a lamp base assembly including a receptacle at the top thereof for detachable contact with the socket prongs and a cavity mounting position associated with the receptacle, the socket prongs being detachably insertable into the lamp base assembly for electrical engagement therewith, and the cavity sized to engage in snug fitting detachable contact with a substantially cylindrical rim provided at the bottom of the lamp socket.

3,725,851

CONNECTOR FOR HIGH AMPERAGE APPLICATIONS

Richard L. Linn, Northbrook, Ill., assignor to Underwriters Safety Device Company, Chicago, Ill.

Filed Jan. 31, 1972, Ser. No. 221,975
Int. Cl. H01r 9/00
U.S. Cl. 339—198 N 8 Claims



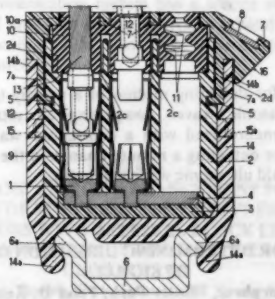
A unitary connector particularly suitable for high amperage applications is disclosed. It provides high density of smaller conductor connections per length of connector. A preferred embodiment facilitates visual inspection of all connections for confirmation of the completeness and security of such connection. The connector can be made from a single metal extrudate and current passes through the integral connector without passing across butting interfaces between elements within the connector assembly.

3,725,852

WATERPROOF ELECTRICAL CONNECTOR

Lucien Blanchet, Le Vesinet, France, assignor to Air LB, Colombes, France

Filed Nov. 18, 1971, Ser. No. 200,003
Claims priority, application France, Nov. 24, 1970, 7042194
Int. Cl. H01r 9/00
U.S. Cl. 339—198 V 6 Claims



Waterproof electrical connector comprises a contact-supporting inner cup, a cover snap-fastened onto the inner cup and through which conductors are admitted to said inner cup, and an outer cup snap-fastened to the inner cup which prevents separation of said inner cup and cover.

3,725,853
ELECTRICAL CONTACT

James E. McKeown, and Donald E. Michel, both of Sidney, N.Y., assignors to The Bendix Corporation, Smithfield, Mich.

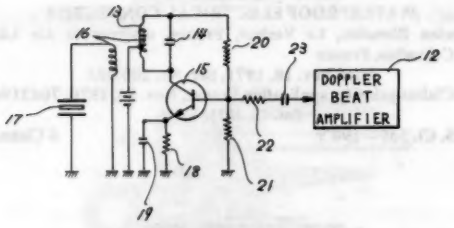
Filed March 22, 1971, Ser. No. 126,803
Int. Cl. H01r 11/22, 25/00
U.S. Cl. 339—252 R 2 Claims

An electrical contact which is comprised of a pair of elongated male electrical conductor members having angled end portions in face-to-face relationship so that when the male members, entering opposite sides of an electrical conductor conduit are forced together, the action of the angled surfaces against one another force the male members into pressure contact with the inner wall of the conduit thereby placing the conduit in electrical circuit relationship with the male members.

3,725,854
SYSTEM FOR DETECTING MOTION OF A NEARBY TARGET BY CONTINUOUS ULTRASONIC WAVES

Kozo Otsuka, Tokyo, Japan, assignor to Toitsu Kogyo Kabushiki Kaisha, Yokohama, Japan

Continuation-in-part of Ser. No. 768,261, Oct. 17, 1968, abandoned. This application June 12, 1970, Ser. No. 45,764
Claims priority, application Japan, May 2, 1968, 43/29642
Int. Cl. G01s 9/66
U.S. Cl. 340—1 R 4 Claims



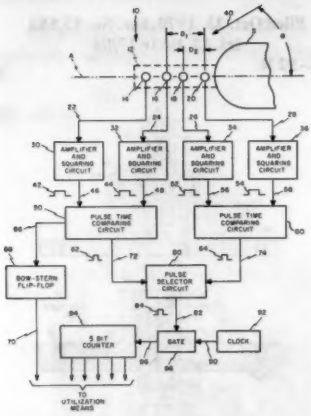
A system for detecting motion of a nearby target by continuous ultrasonic waves comprising an ultrasonic wave resonator, synchronized with a continuous wave generator, and means for detecting a minute change in the radiation impedance of said ultrasonic wave resonator.

3,725,855
SYSTEM FOR DETERMINING DIRECTION OF ARRIVAL OF SIGNALS

Francis J. Murphree, Winter Park; Peter D. Kenndey, Casselberry, and Richard B. Webster, Winter Park, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 23, 1971, Ser. No. 173,762
Int. Cl. H04b 7/08
U.S. Cl. 340—6 R 7 Claims

Determination of direction from which energy waves, e.g., sonar signals, arrive utilizes a plurality of pairs of hydrophone probes on a common axis and averages time delays of one pair with delays of other pair. Circuitry rejects first portion of

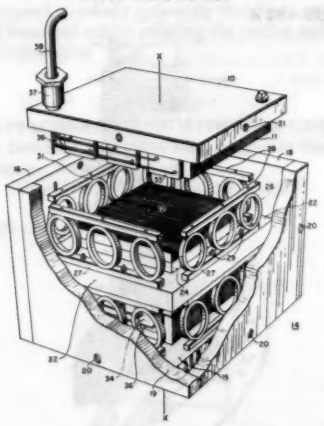


signals, then selects equal number of signals from each probe pair for averaging.

3,725,856
PUSH-PULL TRANSDUCER

John Chervenak, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 24, 1956, Ser. No. 611,798
Int. Cl. G01v 1/00
U.S. Cl. 340—8 R 12 Claims

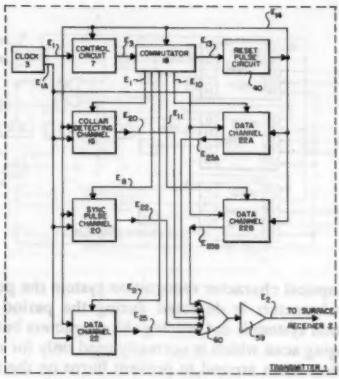


An electro-acoustic transducer is disclosed comprising an enclosing hollow piston element of relatively light rigid non-magnetic material; a central vibratory mass element is situated within said piston element having opposite portions of magnetic material. The use of the piston-action vibrator unit eliminates complex modes of vibration, resulting in higher efficiency than ordinary diaphragm action.

3,725,857
MEANS AND METHOD FOR TIME-SHARING MULTICHANNEL WELL LOGGING

Robert William Pitts, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,395
Int. Cl. G01v *1/22*
U.S. Cl. 340—18 CM 33 Claims

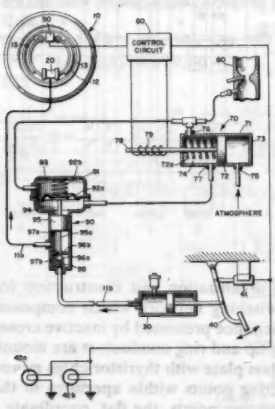


A transmitter in a borehole provides a pulse train to a surface receiver. Each cycle of the pulse train is divided into a plurality of time intervals, and the pulses in each time interval correspond to a different sensed condition of the borehole or the nature of the earth formation traversed by the borehole. The receiver separates the pulses of the pulse train according to time interval and provides an output for each time interval. Each output provided by the receiver corresponds to a different sensed condition of the borehole or nature of the earth formation.

3,725,858
VEHICLE SKID CONTROL DEVICE

Hiroshi Arai, and Jun Ohta, both of Toyota-shi, Aichi-ken, Japan, assignors to Toyota Jidosha Kogyo, Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan

Claims priority, application Japan, Dec. 30, 1970, 45/134519
Int. Cl. B60t *8/08*
U.S. Cl. 340—53 2 Claims

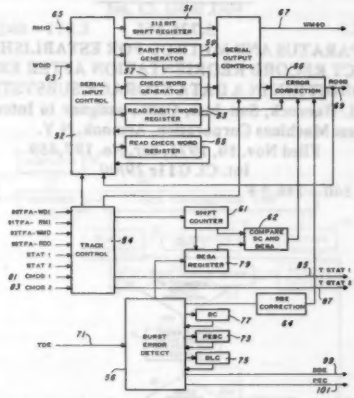


A skid control device for vehicles, comprising a wheel velocity voltage generator adapted to generate a voltage corresponding to wheel velocity, a control circuit adapted to produce a braking pressure reducing signal by determining the occurrence of wheel lock from the wheel velocity voltage, an electromagnetic three-way change-over valve responsive to the braking pressure reducing signal to modulate the braking pressure, a braking pressure modulator which changes the braking pressure of the wheel cylinder by means of the operating signal from said change-over valve, a braking switch adapted to produce an electric signal in conformity with the effort applied to the brake pedal, and an AND circuit adapted to produce a skid control signal in accordance with the "and" of the signal derived from the controller and the signal derived from the braking switch, thus preventing the wheel from becoming locked during braking.

3,725,859
BURST ERROR DETECTION AND CORRECTION SYSTEM

Charles M. Blair, Dallas, and Frank L. Huband, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 14, 1971, Ser. No. 152,941
Int. Cl. G06f *11/12*
U.S. Cl. 340—146.1 AL 4 Claims



A data communication system has a source of data. The data is divided into data segments. When a burst error is indicated, the location of the burst error is determined and the burst error is corrected.

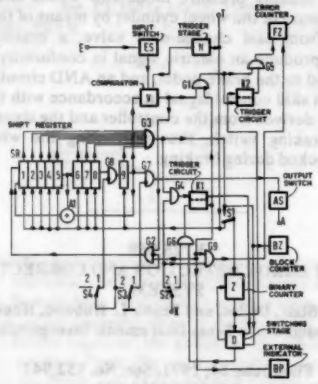
3,725,860
PROCESS AND CIRCUIT ARRANGEMENT FOR THE MEASURING OF THE FREQUENCY OF BIT ERROS AND BLOCK ERRORS WITH OPTIONAL BLOCK LENGTH IN THE TRANSMISSION OF BINARY CODED DATA CHARACTERS

Jurgen Kemper, Zurich, Switzerland, and Erwin Schenk, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed April 20, 1971, Ser. No. 135,645
Claims priority, application Germany, April 29, 1970, P 20 21 098.4
Int. Cl. G08c *25/00*
U.S. Cl. 340—146.1 AX 4 Claims

A process and apparatus are described for measuring the frequency of bit errors and block errors with optional block

length in the transmission of binary coded data characters, in which at the sending station, a certain test text with fixed text



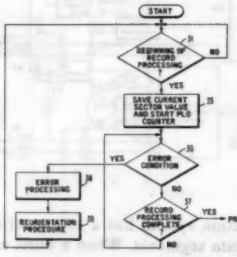
cycle length is sent out and in which the error measurement takes place at a receiving station.

3,725,861

APPARATUS AND METHOD FOR ESTABLISHING EXACT RECORD REORIENTATION AFTER ERROR CONDITION IN A DATA STORAGE SUBSYSTEM

Robert J. Hancock, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1971, Ser. No. 197,459
Int. Cl. G11c *29/00*
U.S. Cl. 340—146.1 F **5 Claims**



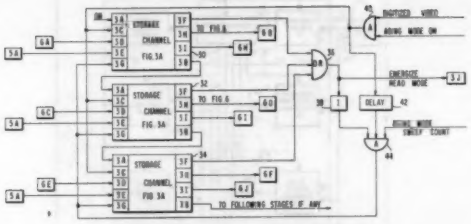
Apparatus and a method in a cyclically readable storage subsystem for establishing exact record reorientation on a record, in order to process said record on a read cycle subsequent to the detection of an error condition in the record. Variable length records are recorded on circumferential tracks, said tracks being divided logically into sectors. At the beginning of processing each record, its sector number is stored and a counter having a period of precisely one revolution is started. If an interrupt due to an error condition establishes the interrupt is handled and, when the selected processing transducer is at the saved sector value minus one on a subsequent revolution, a specified time delay T is begun. At time T, a timer creates a first window W1 under which the counter is continuely checked for a predetermined value which the counter should achieve just prior to the beginning of the record. Upon detection of this value, a second timer creating a second window W2 is started and a beginning of record indicator is searched for under this window. Detection of the beginning of record indicator within W2 extablishes the reorientation.

3,725,862

LINE FINDING SYSTEM AND METHOD FOR CHARACTER RECOGNITION

David C. Roberts, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 790,615, Jan. 13, 1969, abandoned. This application June 25, 1971, Ser. No. 157,047
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 H **8 Claims**



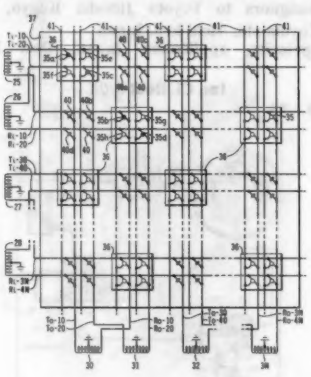
In an optical character recognition system the position of a line of characters is detected during the period when the recognition system is not reading the characters but is executing an aging scan which is normally used only for moving the recognition beam around to prevent burns on the face of the recognition system video scanner. The line positions are stored for use during the read mode of the recognition system. The positions of lines actually read during the read mode are compared with these stored positions to determine that all lines in stored positions were actually read. If not read, the read mode is re-executed to read these lines.

3,725,863

BALANCED SEMICONDUCTOR SWITCHING NETWORK CIRCUIT AND CONSTRUCTION

Laimons Freimanis, Chicago, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1971, Ser. No. 209,330
Int. Cl. H04q *3/50*
U.S. Cl. 340—166 R **13 Claims**

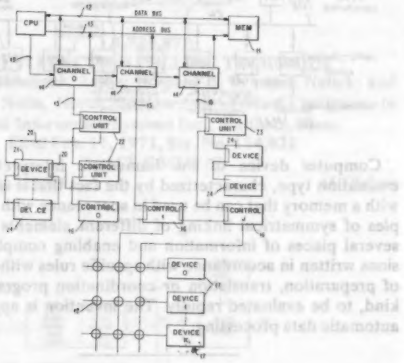


A circuit organization and construction for a solid state, balanced switching network which compensates for the inherent capacitance presented by inactive crosspoint elements. Intersecting tip and ring conductors are mounted on opposite sides of a glass plate with thyristor chips mounted at alternating intersecting points within apertures in the plate. At the other intersecting points, the flat, coordinate conductors are so dimensioned that, with the interposed glass as a dielectric, capacitors are formed which present capacitances at idle crosspoints substantially canceling the capacitances presented by nonconducting thyristors.

3,725,864
INPUT/OUTPUT CONTROL

William A. Clark, Boulder, Colo.; Kent A. Salmond, Los Gatos, Calif., and Thomas S. Stafford, Dunwoody, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 3, 1971, Ser. No. 120,563
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **54 Claims**



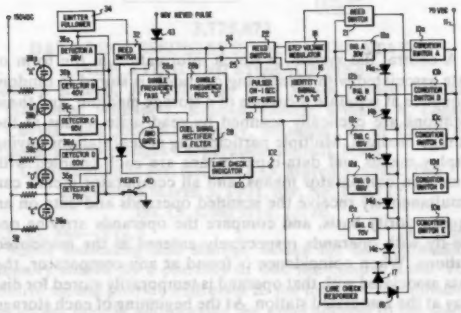
An input/output control system for a data processor which controls the transfer of data from I/O devices (such as disks or drums in which data are recorded in fixed sector lengths and in which the devices are capable of signalling when they reach any desired sector).

A plurality of channels for scheduling and executing input/output programs are provided, each capable of being logically connected to a device through a cross-point switch. I/O tasks are placed in a queue common to the channels. Channels extract tasks from the queue and execute channel programs associated with the tasks. During latent periods of devices channel programs corresponding to the devices are queued in device queues. This frees a channel to go on to another task. When a device is at a point where its program can be continued, any free channel which has access to the device responds, re-enters the program by extracting it from the device queue, and resumes execution of the program.

3,725,865
ELECTRONIC ALARM SYSTEM

Anthony Prince Fairchild, Aspen, Colo., assignor to Synectron, Inc., Aspen, Colo.

Filed May 3, 1971, Ser. No. 139,792
Int. Cl. G08b *19/00*
U.S. Cl. 340—172 **10 Claims**

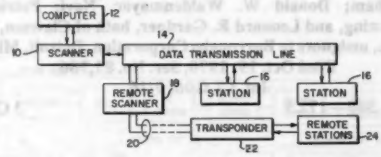


An electronic alarm system providing an indication of conditions existing at a number of locations with each location being equipped with a number of sensors for indicating each of a number of different types of conditions. Each sensor at a given location, when actuated, produces a step voltage output having an amplitude different from the amplitudes produced by the other sensors at that location. The step voltage output of a sensor at a given location is modulated by one signal of a dual frequency signal, the frequencies of which are peculiar to the particular sending station or location. A pulse operated reed switch is placed at the output of each sending station and permits the modulated signal to be transmitted therefrom in response to the presence of an output at one of the condition response sensors. The signal is transmitted to a central location containing a plurality of receiving stations, and the transmitted signal will actuate that receiving station which is frequency-tuned to the transmitted signal. An arrangement of Zener diode and silicon controlled rectifier detectors are used to sense the D.C. voltage level to identify the condition existing at the sending or remote station.

3,725,866
DATA COMMUNICATION SYSTEM

Homer R. Oldfield, Jr., Weston; Edward B. Rawson, Lincoln, and Daniel B. Schwarzkopf, Stow, all of Mass., assignors to Searle Medidata, Inc., Waltham, Mass.

Filed March 8, 1971, Ser. No. 121,938
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **13 Claims**



A data communication system especially adapted for multiphasic health screening in which stations remote from a central processor by a link of significant communications delay are communicative with the system identically as local stations operative in the system without delay.

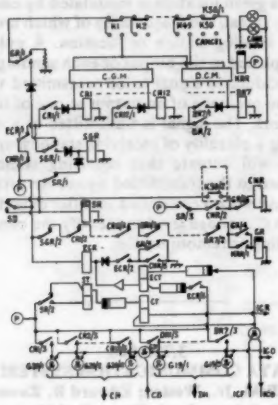
3,725,867
A SELECTIVE CONTROL SYSTEM FOR DISPATCHING ARTICLES ON A CONVEYOR

John H. Jordan, London, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed April 22, 1970, Ser. No. 30,840
Claims priority, application Great Britain, May 2, 1969, 22,498/69
Int. Cl. G06k *17/00*; G11b *27/14*; G05b *19/30*
U.S. Cl. 340—172.5 **7 Claims**

A control system is proposed which is of more special but not exclusive application to the dispatching of articles on a conveyor and where the conveyor can be carrying many objects at one time which are destined for discharge at different points. Dispatching of an object is accompanied by entry into a computer type store of a count representation and a representation which identifies the action to be performed when the count representation has been decremented to a sig-

nificant value. Decrementing of the count representation is effected after predetermined elapsed intervals or events which



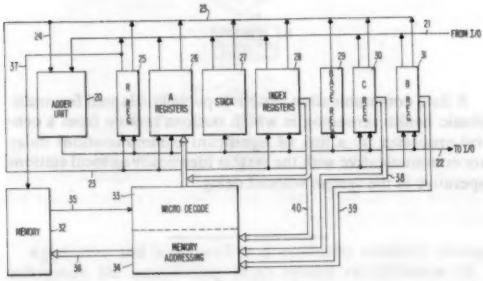
in the case of the conveyor system correspond to set distances covered by the conveyor.

3,725,868

SMALL RECONFIGURABLE PROCESSOR FOR A VARIETY OF DATA PROCESSING APPLICATIONS

Michael M. Malmer, Jr., Livonia; Cornelius C. Perkins, Birmingham; Donald W. Waldenmayer, Novi; Patrick J. Chowning, and Leonard R. Gardner, both of Clawson, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 19, 1970, Ser. No. 81,786
Int. Cl. G06f 9/16
U.S. Cl. 340—172.5 **3 Claims**



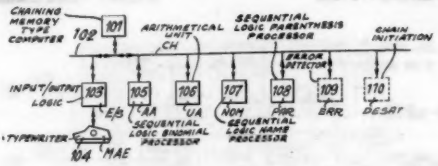
An improved microinstruction data processor capable of operating as an independent processor or as a terminal unit for a large general purpose computer employing a read/write disk memory to hold both macroinstructions and microinstructions, wherein the microinstructions implement macroinstructions. The memory has a macroinstruction portion and a microinstruction portion having a changeable boundary therebetween to accomodate a variable number of microinstructions. A push-down stack facilitates microprogram branching and returning by holding microinstruction return addresses when microinstructions call for branching to microprogram subroutines. A microinstruction decoding register augmented with a microinstruction buffer register decodes a previously fetched microinstruction while a new microinstruction is fetched from memory.

3,725,869

COMPUTER DEVICE

Boris Alexandre Sokoloff, 4, rue Boris Vilde, Fontenay-aux-Roses, France

Filed Nov. 23, 1970, Ser. No. 92,117
Int. Cl. G06f 7/38, 13/06
U.S. Cl. 340—172.5 **8 Claims**



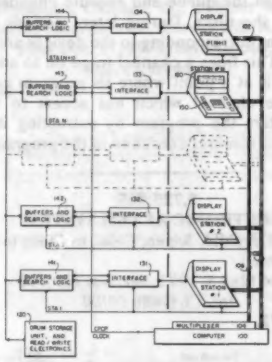
Computer device of the immediate interpretation and evaluation type, characterized by the fact that it is combined with a memory that can be used in accordance with the principles of symmetrical linking of different elements of one or several pieces of information and enabling complex expressions written in accordance with specific rules without the aid of preparation, translation or coordination programs of any kind, to be evaluated rapidly. The invention is applicable to automatic data processing.

3,725,870

PARALLEL-ACCESS DATA FILE SYSTEM

Marvin Felcheck, Monsey, N.Y.; Wallace Kirschner, Trumbull, Conn.; Robert J. Jarosik, Stratford, Conn., and Charles W. Capes, Bethel, Conn., assignors to Pitney Bowes-Alpex Inc., Danbury, Conn.

Filed Dec. 24, 1970, Ser. No. 101,371
Int. Cl. G06f 7/34, 13/06; G06k 15/20
U.S. Cl. 340—172.5 **12 Claims**



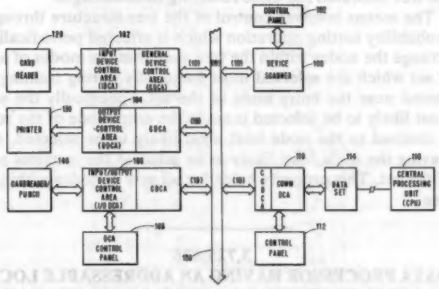
A central file system in which information in the form of data associated with identifying operands is stored in random sequence at separate locations of a storage medium, and these locations are cyclically scanned by read/write means at the storage medium. Multiple participating access stations having display means and data-input means are each coupled with their own comparator means, and all comparator means can simultaneously receive the scanned operands and data on an equal priority basis, and compare the operands arriving on-the-fly with operands respectively entered at the associated stations. When coincidence is found at any comparator, the data associated with that operand is temporarily stored for display at the associated station. At the beginning of each storage medium location being read-out, each station seeking coincidence has its search logic reset to assume coincidence for that particular storage location, and then a bit-by-bit on-the-fly comparison is made as the information is read out. If coin-

cidence persists for the whole operand being read from that storage location, the data therein is retained for display. If not, the data is dumped from that station's temporary storage register by replacement with data read-out from the next storage location to be scanned. Any station can update the central storage medium's information by entering a priority mode, in which the other stations are momentarily locked-out from access, and then erasing and/or replacing data in a particular storage medium location.

3,725,871
MULTI FUNCTION POLLING TECHNIQUE

Robert E. Heuttner, Acton; Edward B. Tymann, Natick; and Richard Nolin, North Andover; all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 11, 1971, Ser. No. 114,431
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 **41 Claims**



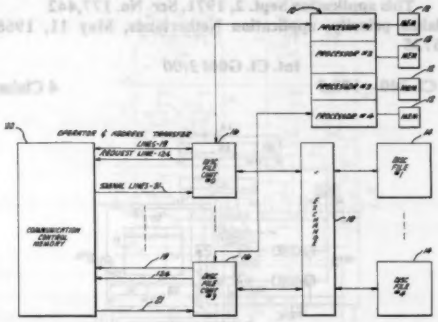
Input devices or output devices connected to a common bus of a communications terminal are polled in response to a polling sequence specially coded to request information from either a single input device or number of input devices or status information from either input or output devices. The sequence is transmitted over a communications channel to control apparatus coupled to the bus. The control apparatus stores representations in accordance with the coding of address information items included within the sequence and initiates operations in response to and in correspondence with the stored representations.

3,725,872
DATA PROCESSING SYSTEM HAVING STATUS INDICATING AND STORAGE MEANS

Edward Balogh, Jr., Diamond Bar; James Russell Bennett, Glendora; William F. Keenan, Goleta; William A. Logan, Covina, and John S. Murphy, Altadena, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 804,613, March 5, 1969. This application March 3, 1971, Ser. No. 120,717
Int. Cl. G06f 9/18, 15/16
U.S. Cl. 340—172.5 **26 Claims**

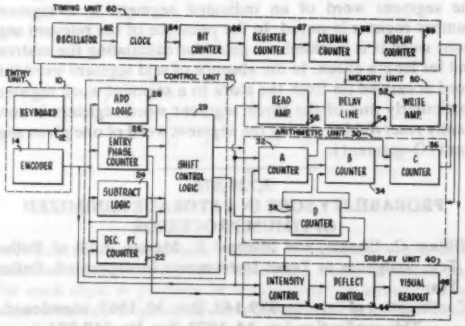
Status indicating and storage means for an addressable memory shared by a plurality of disc file control units. The control means provide addresses to the memory for initiating an access therein and provide the same address to the status indicating and storage means. The status indicating and storage means receives the address and has a memory in which received addresses are stored together with an associated indicium. The indicium indicates whether the corresponding address is in use. The status indicating and storage means is operative for providing an output indication of a stored indication of use for a received address.



3,725,873
CALCULATOR HAVING A SEQUENTIAL ACCESS STACK

George H. Hare, Oakland, Calif., assignor to The Singer Company

Continuation of Ser. No. 725,960, May 1, 1968, which is a continuation of Ser. No. 366,235, May 11, 1964, abandoned. This application April 7, 1971, Ser. No. 132,237
Int. Cl. G06f 3/14
U.S. Cl. 340—172.5 **20 Claims**

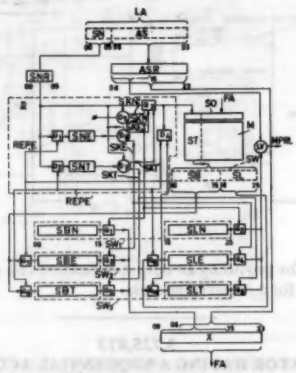


An electronic desk top calculator wherein digit data is entered into an entry register, and arithmetic and other control functions are initiated, by means of a keyboard, and wherein the entered data is stored in an automatic sequential access store. The entry register and at least one of the registers of the automatic sequential access store are displayed in superadjacent rows of juxtapositioned digits with like-order digits aligned column-by-column. Whenever new data is entered, any data previously contained in the entry register and the registers of the automatic sequential access store is shifted to the next higher order register in the store. Similarly, on the initiation of any function which removes the data from the entry register, or which combines the data in the entry register with the data in the next higher order register in the store as the result of a mathematical function, any data contained in the remaining registers of the store is shifted to the next lower order register of the store.

3,725,874
SEGMENT ADDRESSING

Jean J. Marie D. Van Heel, Beekbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 822,681, May 7, 1969, abandoned.
This application Sept. 2, 1971, Ser. No. 177,442
Claims priority, application Netherlands, May 11, 1968, 6806735
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 4 Claims

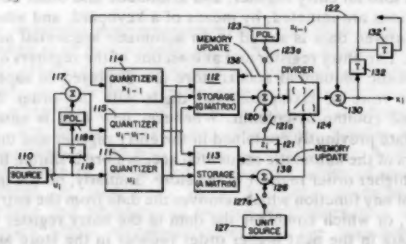


A computer comprising a store addressable in segments, containing segment words selectable by segment numbers, which words contain data of the segment, for example, a segment base address and a segment length information, in which two or three segment word registers are provided for storing two or particularly three segment words in order to ensure a rapid run of the programmes in the event of frequent change of addressing in a plurality of segments. The computer for this purpose with a detection device for detecting whether and, if so, in which of the in total two or three segment word registers the segment word of an indicated segment in a segment number register is stored. In the presence of the relevant segment word it is released via gates for calculating the address and for length check. In the absence of said segment word this word is carried on from the store to a segment word register. Particularly one of the three segment word registers is constantly reserved for storing the segment word of one given segment (O-segment).

3,725,875
PROBABILITY SORT IN A STORAGE MINIMIZED OPTIMUM PROCESSOR

William C. Choate, and Michael K. Masten, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 889,143, Dec. 30, 1969, abandoned.
This application Jan. 14, 1972, Ser. No. 217,771
Int. Cl. G06f 15/18
U.S. Cl. 340—172.5 6 Claims



A trainable signal processor having at least one input signal u and one desired output signal z applied thereto during training and having at least one actual output signal derived therefrom during execution is provided. From each member of the input sequence $u(t_i)$ a key K_i is generated. K_i may have only a finite number of values and is a single valued function of u. Corresponding to each value of the K_i generated during training, a trained response is derived from samples of the desired output signal z measured at those instances t_i at which that value of K_i occurred. This operation is such that the contemporary value of the trained response is maintained in a tree allocated file. The file thereby associates with each key K_i a trained response. Storage is provided for only those K_i which actually occurred during training, which is an important attribute since these typically constitute a small fraction of those values which may theoretically occur, especially when the input is of multi-dimensional character. During execution the tree allocated file provides for efficient retrieval of the trained responses which are employed in determining the actual output signal of the processor.

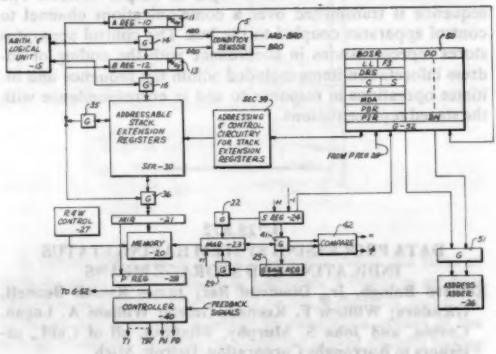
Whereas the tree allocation can greatly reduce the storage relative to that of the storage-wise inefficient method of direct addressing, the speed of operation is less due to the need to perform a sequence of operations on components of the key. Disclosed herein is a means of greatly improving the speed of the tree allocated file while retaining its advantages.

The means involves control of the tree structure through a probability sorting operation which is effected periodically to arrange the nodes within the tree such that the modes of a filial set which are selected most frequently during training are placed near the entry node of the set. Specifically the node most likely to be selected is made the entry node of the set; it is chained to the node next most likely to be selected, etc., leaving the node least likely to be selected the terminal node of the set. This property holds for all sets of nodes within the tree.

3,725,876
DATA PROCESSOR HAVING AN ADDRESSABLE LOCAL MEMORY LINKED TO A MEMORY STACK AS AN EXTENSION THEREOF

Erwin A. Hauck, Arcadia, Calif., assignor to Burroughs Corportion, Detroit, Mich.

Filed Feb. 8, 1972, Ser. No. 224,420
Int. Cl. G06f 7/10; G11b 27/00
U.S. Cl. 340—172.5 17 Claims



A data processing system has a main memory for storing a stack of information for processing. Stored in the main memory stack are control words which mark off procedural areas of the stack, operand words for processing, and reference words for indicating locations of control words and of operand words. A pair of high speed registers are provided for coupling information to the processor's arithmetic unit for processing. These two registers are linked to the stack so that they are the top two available locations of the stack. The processor includes a plurality of high speed registers which are linked to the memory stack to form a stack extension. Stored

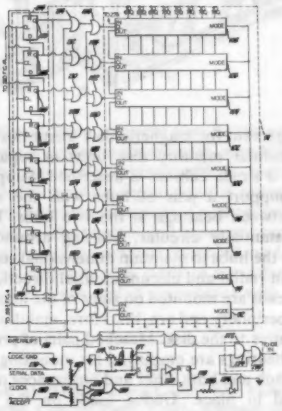
in the stack extension are control words that form a part of an address environment list and a stack history list; parameters that are local to the current addressing environment; and operands that have been called to the top of the stack. Words stored in the stack extension are captured and are not pushed down into the memory stack during the execution of a procedure. Means are provided for addressing each register within the stack extension and for coupling captured information therein to the register which is the top available location of the stack. Means are provided for updating the stack extension when a new procedure is entered so that it will capture the information relating to the new procedure.

3,725,877

SELF CONTAINED MEMORY KEYBOARD

Ronald B. Keil, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed April 27, 1972, Ser. No. 248,290
Int. Cl. G06f *3/02*, *11/06*
U.S. Cl. 340—172.5 **3 Claims**



A keyboard unit is disclosed for temporarily storing information for subsequent transfer to a computer. The unit includes a plurality of pushbuttons interconnected with a two-digit display through encoding and decoding circuitry, for operator verification of data entered and further includes a shift register memory for temporarily storing the data entered. The shift register memory is programmed by a counter so that the data is sequentially stored in the individual shift registers. The shift registers are operable in either a parallel input or serial output mode under the control of a flip-flop which responds to connection and disconnection of the memory keyboard with a computer. During the temporary storing of data the shift registers operate in a parallel mode. When the keyboard memory is connected with a computer the shift registers are switched to their serial output mode and the data is transmitted to the computer under computer control. A code word is stored in one of the memory shift registers to permit identification of the keyboard memory unit from which the data is being received. In the serial transmission of data to the computer a wrap-around circuit is provided which permits redundant transmission of data for verification by the computer.

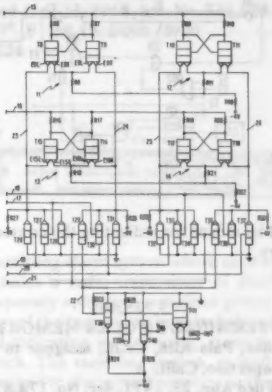
3,725,878

MEMORY CELL CIRCUIT

Andrew R. Berding, Sunnyvale, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,536
Int. Cl. G11c *11/40*; H03k *3/286*
U.S. Cl. 340—173 FF **6 Claims**

A memory cell circuit is provided with a plurality of cells arranged in rows and columns. Each cell comprises a pair of cross-coupled transistors with the collector of each transistor direct-coupled to the base of the other transistor Each



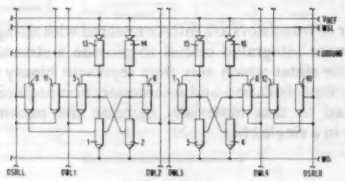
transistor has a pair of emitters. One emitter of each pair is connected in a current-switch mode with the emitters of the sense amplifier transistors.

3,725,879

FUNCTIONAL MEMORY CELL

David H. Martin, Canterbury, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,791
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 AM **10 Claims**



A functional memory cell circuit is provided with a sense line and a drive line for each word, and a pair of search lines for each digit. A plurality of binary cells are arranged in arrays. Circuitry is provided for causing current to flow in the word sense lines in response to mismatches between the signal states of the digit search lines as compared with the respective signal states of the binary cells. The amplitudes of the search currents in the word sense lines are relatively constant irrespective of the number of mismatches in each word.

3,725,880

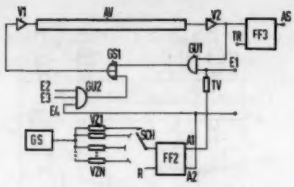
ARRANGEMENT FOR THE DETECTION OF FAULTS IN ELECTRONIC CIRCUITS

Harald Sachs, Faistenhaar, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 4, 1971, Ser. No. 120,987
Claims priority, application Germany, March 13, 1970, P 20 12 068.7
Int. Cl. G11c *21/00*
U.S. Cl. 340—173 RC **3 Claims**

An arrangement for searching for errors in electronic circuits employs a circulating memory for storing the output signals of the circuit to be checked, a gate circuit which

generates a write-stop signal upon the occurrence of an error to prevent storage of the output signals into the circulating



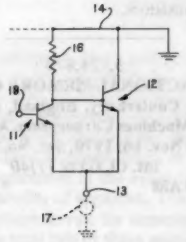
memory, and by means for indicating the content of the circulating memory.

3,725,881

TWO TERMINAL BIPOLAR MEMORY CELL

Roger B. Dellor, Palo Alto, Calif., assignor to Intersil Incorporated, Cupertino, Calif.

Filed Aug. 25, 1971, Ser. No. 174,878
Int. Cl. G11c *11/40*; H03k *3/286*
U.S. Cl. 340—173 FF **6 Claims**



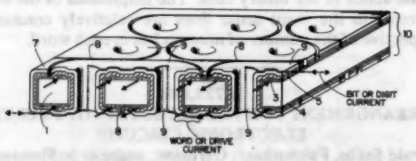
A pair of transistors are interconnected with a single resistor as a bipolar integrated circuit to provide a structure having two stable states which may then represent binary states in a memory unit. Isolation and interconnection requirements are minimized to thus materially increase the packing density possible in a single chip.

3,725,882

MEMORY ELEMENT AND CONFIGURATION

John H. Kefalas, North Billerica, and Roman E. Lukianov, Framingham, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 18, 1969, Ser. No. 886,273
Int. Cl. G11c *5/04*, *11/06*
U.S. Cl. 340—174 M **8 Claims**



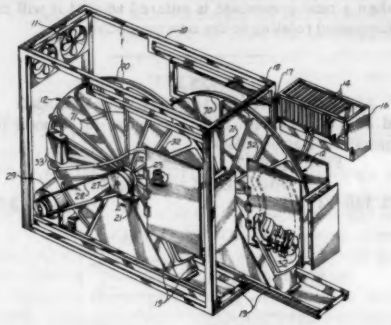
A data storage device has a number of mutually separate, closed-flux-path magnetic elements arranged within a plane in an array of columns and rows. Each of a first set of conductors surrounds a respective column of magnetic elements and is magnetically linked therewith. Corresponding to each row of elements is a conductor of a second set of conductors which threads through the magnetic elements of its respective row.

3,725,883

MODULAR DISK FILE UNIT

Eugene E. Bennett, and Alpheus F. Stansell, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 864,296, Oct. 3, 1969. This application March 13, 1972, Ser. No. 234,170
Int. Cl. G11b *5/00*, *5/74*; G11c *11/02*
U.S. Cl. 340—174.1 C **12 Claims**



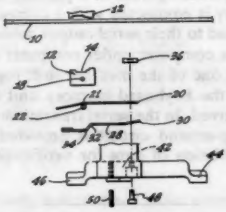
An arrangement for magnetic disk memories having a plurality of modular memory disk units in separate housings mounted in a single cabinet is described. Support yokes for each unit support a pair of hubs with the rotatable disk mounted between bearings in the two hubs. In addition, a closed, substantially circular, housing around the disk is mounted on the hubs to maintain dimensional stability relative to the disk in radial and circumferential directions. Magnetic recording heads are mounted on sides of the housing generally toward the periphery and are, therefore, maintained in precise position relative to the disk. Matched pairs of preloaded angular contact bearings are employed for mounting the disk on a shaft in the hub and both inner and outer races of the bearings are clamped in place. Undue loads on the bearings are prevented by making the housing with flexural rigidity in a direction along the axis of the bearings high enough to hold the recording heads in substantially fixed position and low enough to apply an insubstantial axial load on the bearings.

3,725,884

FLYING HEAD SUPPORT WITH DAMPING MEANS

Irwin B. Garfein, Los Angeles, Calif., assignor to Engineered Data Peripherals Corporation, Santa Monica, Calif.

Filed Aug. 20, 1970, Ser. No. 65,516
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1 E **9 Claims**



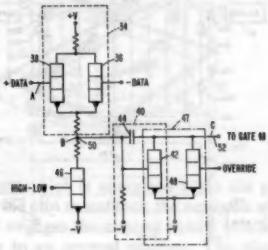
A flying head support with damping means includes a spring support for a magnetic head, which spring support maintains the magnetic head adjacent to a magnetic disc and wherein a thin film of air is produced between the head and the disc by the rotation of the disc. Damping means are supported relative to the spring support and with the damping means pressing against the spring support to damp vibrations in the magnetic head.

3,725,885

METHOD AND APPARATUS FOR AMPLITUDE SENSING AND DATA GATING IN A MAGNETIC-STORAGE DEVICE WITH DIGITAL INTERFACE

Rolf Andresen, Broomfield, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 28, 1970, Ser. No. 76,144
Int. Cl. G11b 5/44
U.S. Cl. 340—174.1 H 12 Claims



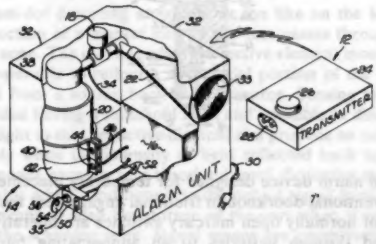
A data signal read from magnetic tape is converted from an analog signal into a digital, or quasidigital, signal by hard limiting. This digital signal is combined with an indication as to whether the amplitude of the digital signal is above a predetermined threshold and then passed to a control unit operating with the tape drive. The control unit generates control signals used to change the predetermined threshold used by the tape drive. A change in threshold is made in accordance with detection of a record block and in accordance with error in the record block.

3,725,886

FLUID-POWERED ALARM SYSTEM

Ronald A. Marks, Canoga Park, Calif., assignor to Consulting Specialists, Inc., Torrance, Calif.

Filed Feb. 9, 1972, Ser. No. 224,731
Int. Cl. G08b 3/06, 23/00
U.S. Cl. 340—224 7 Claims



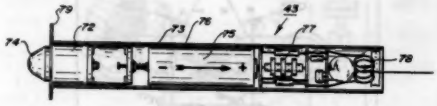
An alarm system provides an audible signal, incorporating a pressurized vessel for supplying fluid to a sonic horn under control of an electrical system and a solenoid valve. The electrical system incorporates independent a.c. and d.c. power arrangements for energizing the valve as well as the remainder of the control system. A trigger circuit is actuated by a receiver and a remotely-located transmitter, to initiate operation, which in the disclosed embodiments involves a compound pattern or cycle for more effective use of the fluid and to increase the severity of the signal as human stimulus. The system also incorporates heater means for maintaining the pressure structure operative over an extended interval of time.

3,725,887

RADIO TRANSMITTING ALARM SYSTEM

Vincent R. Sneider, Paramus, N.J., assignor to Sneider Electronic Systems, Inc., Passaic, N.J.

Filed June 10, 1968, Ser. No. 735,670
Int. Cl. G08b 19/00
U.S. Cl. 340—224 5 Claims



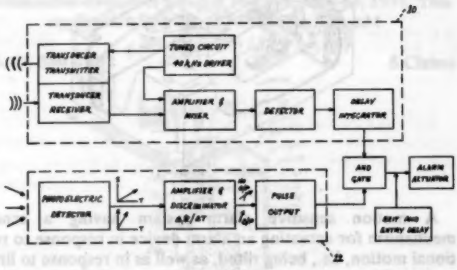
A radio transmitting alarm system where each signal actuating device includes a radio transmitter of short range and determined frequency and a self-contained power supply. The switch actuation of the transmitter may include a plunger-type switch, a level-indicating switch using mercury or a heat-responsive switch. The receiving station, as well as having a radio receiver tuned to the same frequency as the transmitter, may have a light, bell or a tape-actuated signal which is sent to a central monitoring station.

3,725,888

DETECTOR SYSTEM

Elias E. Solomon, Duxbury, Mass., assignor to Pyrotector, Incorporated, Hingham, Mass.

Filed April 5, 1971, Ser. No. 131,222
Int. Cl. G08b 13/16, 13/18
U.S. Cl. 340—258 A 3 Claims



An intruder detector system that utilizes both a Doppler effect detector system and an optical detector system monitoring the same space. An alarm output signal produced by either detector under alarm conditions is prevented from activating an alarm unless the other detector also is producing an alarm signal.

3,725,889

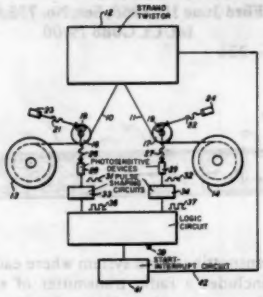
LOGIC CIRCUITRY FOR MONITORING THE CYCLIC OPERATIONS OF A PAIR OF DEVICES

John J. Glosek, Roselle, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 1,611, Jan. 9, 1970, Pat. No. 3,624,522.
This application June 4, 1971, Ser. No. 150,163
Int. Cl. B65h 63/02; G08b 21/00
U.S. Cl. 340—259 3 Claims

Logic circuitry is utilized to monitor the continued cyclic operation of a pair of devices, e.g., strand feeding devices. As the devices function a pair of trains of pulses are generated and the logic circuit detects and generates a malfunction signal upon the generation of two pulses within one train without the intervening generation of a pulse in the other train. The logic circuit accepts concurrent generation of pul-

ses, and the subsequent reversal of the lead pulse in the trains without the generation of malfunction signals. Facilities are



also provided to allow the devices to commence operation independent of control by the logic circuits.

3,725,890

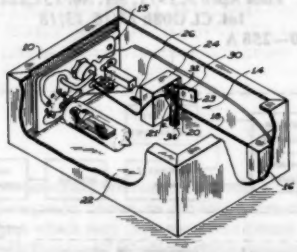
MOTION SENSITIVE ALARM SYSTEM

John C. Cirino, Lyndhurst, Ohio, assignor to Gregory Sales Co., Cleveland, Ohio

Filed March 17, 1971, Ser. No. 125,127

Int. Cl. G08b *13/02*

U.S. Cl. 340—262 **26 Claims**



A motion sensitive alarm system having a sensing mechanism for actuating an alarm device in response to rotational motion, i.e., being tilted, as well as in response to linear motion. The alarm system includes a generally V-shaped conductive cage, a flexible rod having one end portion fixedly mounted, and an elongated cylindrical weighted member carried by the other end portion of the flexible rod. The cylindrical weighted member is disposed in a direction generally perpendicular to the direction of the elongated flexible rod. Accordingly, the weighted member begins oscillating in response to either rotational or linear acceleration. When the weighted member begins oscillating, it contacts the V-shaped conductive cage to thereby actuate the alarm device. The alarm device remains energized for a predetermined period of time and is then de-energized by a time-delay thermal relay.

3,725,891

PROTECTIVE BUILDING STRUCTURE

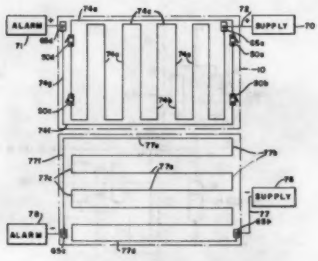
Elton W. Miller, 285 Franklin St., Harrisonburg, Va.

Filed Sept. 8, 1970, Ser. No. 70,158

Int. Cl. G08b *13/08*, *13/12*

U.S. Cl. 340—273 **8 Claims**

A protective structure having a plurality of independent alarm circuits adapted for use adjacent to a window or the like opening in a building wall. The structure includes a frame and a plurality of insulating members secured within the frame. Each of the insulating members defines an opening for receiving an electrical conductor therein. Since each of the insulating members may be fractured by the application of a predetermined amount of force thereon, for example by an intruder, a rupturing of the electrical conductor by the fracturing of the insulating member will cause an alarm to be actuated. The frame defines a pair of perimetric recesses about the outer periphery thereof to accommodate conductors therein so that if the frame is ruptured, an alarm will likewise be sounded. The conductors in one recess are in circuit with the



conductors in certain of the insulating members, while the conductors in the other recess are in circuit with the conductors in the remaining insulating members so that a pair of independent circuits are provided. A plurality of tamper switches are also disposed in the device so that attempts to remove the protective structure from the opening in the building wall will also actuate an alarm. Thus, the structure is effective against attempts to remove the structure, to sever its frame, or break through the opening defined by the frame.

3,725,892

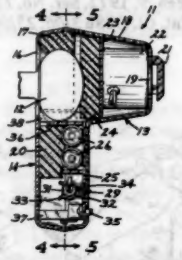
DOOR KNOB BURGLAR ALARM

Frank J. Faltico, Edina, Minn., assignor to Allied Trading Co., Minneapolis, Minn.

Filed April 26, 1971, Ser. No. 137,190

Int. Cl. G08b *13/08*

U.S. Cl. 340—274 **4 Claims**



An alarm device designed for temporary placement over a conventional doorknob in frictional engagement therewith. A pair of normally open mercury switches are operatively connected through batteries to an annunciating buzzer, and unauthorized rotation of the doorknob in either direction closes one of the switches to actuate the buzzer.

3,725,893

MONEY CLIP ALARM FOR A CASH DRAWER

Jacob H. Malta, Doylestown, and Harrison E. Cassel, Cedars, both of Pa., assignors to Schulmerich Manufacturing Co., Sellersville, Pa.

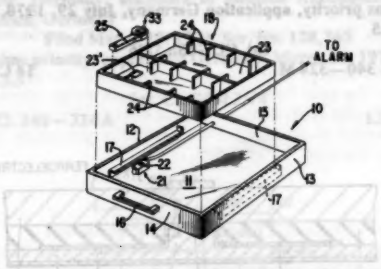
Filed Nov. 23, 1970, Ser. No. 91,796

Int. Cl. G08b *13/02*

U.S. Cl. 340—280 **8 Claims**

A compartmented insert for a cash drawer is provided with a money clip which includes a pivotally mounted drop actua-

tor retained in a raised position by a paper bill inserted in the clip. The actuator is positioned over an opening in the bottom of the insert through which protrudes a control switch mounted on the bottom of the drawer. The control switch is normally closed when its switch arm is raised and is connected



to an alarm circuit which is energized when the paper bill is withdrawn from the clip to unblock the actuator which pivots downwardly and engages the control switch arm to move the arm downwardly to an opened position. The alarm is especially useful in conjunction with operation of bank, or the like, security or surveillance systems.

3,725,894

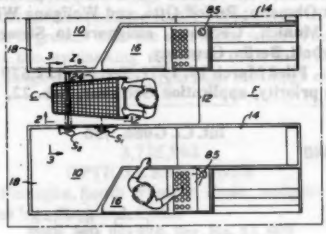
PHOTOCELL CONTROLLED SHOPPING CART PACKAGE DETECTOR

Edwin A. Geisler, 7339 Central Avenue, Philadelphia, Pa.

Filed Sept. 27, 1971, Ser. No. 184,043

Int. Cl. G08b *13/00*

U.S. Cl. 340—280 R **7 Claims**



A system for detecting an article or the like on the lower storage section of a market cart as the cart passes through a scanning zone. The cart has a light reflective element mounted thereon operable to reflect a substantial portion of the light projected from a source back to said source. Sensing means are provided having a threshold level and operable to direct a beam of light to said reflective element and produce an output signal only when the intensity of light reflected back to the sensing means exceeds said threshold level. Scanning means are operable when conditioned by the output signal from said sensing means to scan the storage of the cart when it passes through the scanning zone. Signal means are operatively associated with said scanning means actuatable when said scanning means is conditioned and an article is present in the storage section of the cart.

3,725,895

STOLEN ARTICLE DETECTION

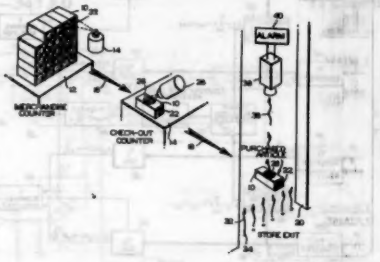
Lawrence B. Haynes, 1205 Kershaw Drive, Raleigh, N.C.

Continuation-in-part of Ser. No. 98,990, Dec. 17, 1970, abandoned. This application July 13, 1972, Ser. No. 271,437

Int. Cl. G08b *13/00*

U.S. Cl. 340—280 **11 Claims**

A method and system for detecting stolen articles such as by shoplifting. Articles in a store and the like are sprayed with a non-toxic, humanly undetectable aerosol which is subject, being highly aromatic in nature, to detection by a sensing device. In removing the treated article a detection area or zone from the store must be passed and if unauthorized or unapproved removal of the article is attempted an indicator or alarm is activated by detection of the aerosol, resulting in apprehension of the article carrier. If the article is paid for or removal from the premises is otherwise authorized, then when passing through an authorizing area such as a checkout counter, the sensible odor can be neutralized or rendered passive or an additional neutralizing agent or means can be applied to the article, either method of which will serve to prevent activation of the detection device.



3,725,896

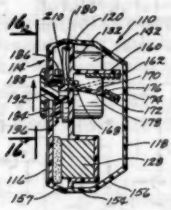
POSITION SENSITIVE ALARM WITH MAGNETIC LATCHING PENDULUM SWITCH

Robert J. Wagner, 5225 Redman Avenue, Omaha, Nebr.

Continuation-in-part of Ser. No. 142,894, May 13, 1971. This application Oct. 12, 1971, Ser. No. 188,031

Int. Cl. G08b *13/08*

U.S. Cl. 340—282 **5 Claims**



An alarm device sounds an audio alarm when it is moved to a predetermined position. The alarm includes a magnetic latching pendulum switch which is normally open but which is closed to energize the alarm when the device falls onto its back portion. A dial lock means is also provided for preventing the pendulum switch from being manually opened until the proper number has been dialed thereon. The device may be used in conjunction with inwardly or outwardly swinging doors, and vertically or horizontally sliding windows. Means is also disclosed for positioning the device with respect to inwardly swinging doors and horizontally sliding windows or doors.

3,725,897

VISUAL DISPLAY SYSTEM

Mark H. Bleiweiss, Marlboro, Mass., assignor to Raytheon Company, Lexington, Mass.

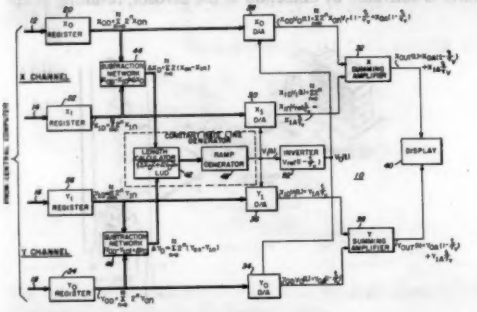
Filed Jan. 20, 1971, Ser. No. 107,930

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **4 Claims**

A constant writing rate vector generator capable of accepting digital inputs representative of the endpoints of a line and

converting them into analog voltages proportional to the transition time of the generated line such that random positioning of the electron beam on a cathode ray tube and the writing of vectors while maintaining an equal and constant



brightness without additional intensity compensation is achieved. The digital endpoint data controls a constant voltage ramp with a time duration directly proportional to the vector length, which ramp is used to control the transition rate of a pair of digital to analog converters.

3,725,898

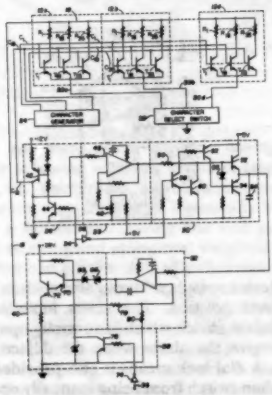
TEMPERATURE COMPENSATED MULTIPLE CHARACTER ELECTRONIC DISPLAY

Joseph R. Canton, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 788,249, Dec. 31, 1968, abandoned. This application May 3, 1971, Ser. No. 139,945

Int. Cl. G05d *23/24*; H05b *3/28*

U.S. Cl. 340—324 **12 Claims**



A temperature compensated multiple character electronic display is described. Each character position includes a multielement matrix controlled by a transistor. The collectors of all transistors of all matrices are common. The emitters of all transistors of a single character matrix are common, and are selectively connectable to ground so that the characters can be sequentially enabled. The corresponding elements of all character matrices are connected to a common control line and are actuated by a single character generator. The power sequentially applied to each character is controlled separately to maintain a uniform display under varying operating temperatures by sampling the voltage of the base-emitter junction of a transistor of the enabled character as a measure of its temperature, and then applying power to the character during the following display cycle that is related to the sampled temperature.

3,725,899

DATA EXHIBITING SCREEN DEVICE WITH A LIQUID-CRYSTAL LAYER, AND METHOD OF MANUFACTURE

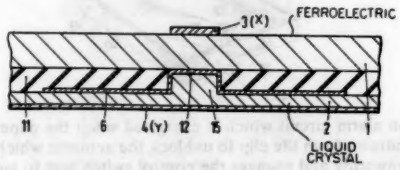
Waldemar Greubel, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Oct. 21, 1970, Ser. No. 82,642

Claims priority, application Germany, July 29, 1970, P 20 37 676.5

Int. Cl. G08b *5/36*

U.S. Cl. 340—324 M **14 Claims**



A data exhibiting screen device comprises a layer of liquid crystals whose light scattering or transparency is controllable by applying an electric field. A ferroelectric layer of ceramic material extends face-to-face in parallel proximity to the liquid-crystal layer and constitutes a capacitance controllable by the magnitude of the applied electric field. Electric field means in the form of a cross-bar arrangement supply the field excitation.

3,725,900

METHOD AND APARATUS FOR THE PRODUCTION OF CHARACTERS AT WILL ON THE PICTURE SCREEN OF A CATHODE RAY TUBE AND/OR ON RECORD PAPER

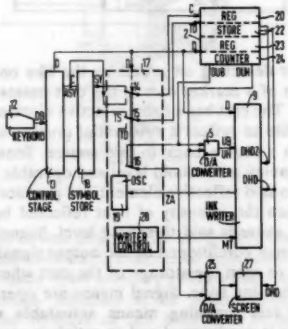
Friedrich Ohmann; Rudolf Otto, and Wolfgang Wiedenmann, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed March 10, 1971, Ser. No. 122,679

Claims priority, application Germany, Feb. 22, 1971, P 20 62 546.1

Int. Cl. G08b *5/36*

U.S. Cl. 340 **1 Claim**

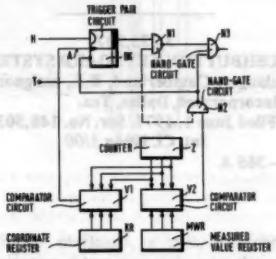


A method and apparatus for representation of characters from signals emitted from a writing signal source, such as a keyboard, data processing installation, card scanner or the like, at will on the picture screen of a cathode ray tube and/or on record paper or a similar data carrier, wherein an image generator is employed to produce data signals for controlling the electron beam on the picture screen of a cathode ray tube, means are provided for deriving from these signals deflecting and/or blanking signals for a record printer, the printer preferably being an ink jet printer.

3,725,901
METHOD OF AND APPARATUS FOR REPRESENTING MEASURED VALUES ON THE SCREEN OF A VIDEO APPARATUS

Eckmar Lehari, and Manfred Schwarztrauber, both of Karlsruhe, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed March 29, 1971, Ser. No. 128,743
Claims priority, application Germany, March 28, 1970, P 20 14 953.5
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A 13 Claims

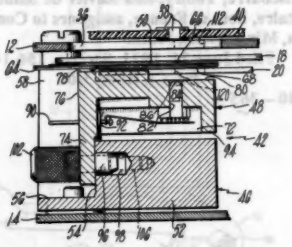


For the reproduction of measured values on the screen of a line scanning video apparatus, the intensity of the beam current thereof is modulated with unblanking signals to a mean value during the writing of each line between the image field edge and the unblanked image dots of the measured values. The beam current and consequently the intensity of the beam for the latter is greater than the said mean value. The frequency value of the unblanking signals is such that the bright-modulated image dots are no larger than the image elements.

3,725,902
OPTICAL ENDCODER

Ronald A. Finnegan, South Windsor, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed July 1, 1970, Ser. No. 51,509
Int. Cl. G08c *9/06*
U.S. Cl. 340—347 P 8 Claims

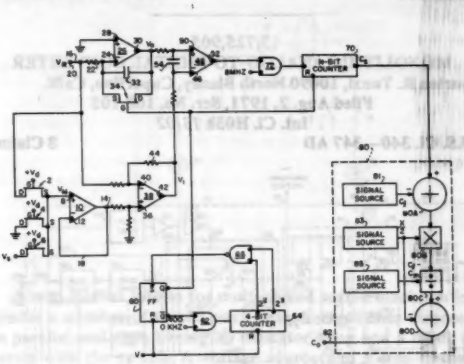


An optical encoder is provided with a new and improved exposure assembly comprising a readily replaceable exposure block fixedly mounting a plurality of individual light bulbs within a predetermined display pattern, a base for the exposure block supporting an apertured display mask within a code display station and aligning means on both the block and the base facilitating accurate and repeated aligned assembly of the block on the base without readjustment of the assembly.

3,725,903
SELF-CALIBRATING ANALOG TO DIGITAL CONVERTER

Henry R. Kosakowski, Denville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Feb. 9, 1971, Ser. No. 113,872
Int. Cl. H03k *13/20*
U.S. Cl. 340—347 AD 11 Claims



A self-calibrating analog to digital converter wherein, if the full scale reading of the converter is defined as X counts, the calibration formula takes the following form:

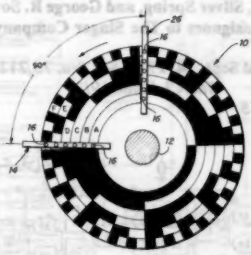
$$C_o = [C_s - C_1][X/2(C_m - C_1)] - X/2;$$ wherein

C_o is the count of the calibrated output; C_s is the count of the analog signal to be converted; C_1 is the count of the low scale calibration point; and C_m is the count of the mid-scale calibration point.

3,725,904
ENCODER WITH A REDUNDANT OPTICAL SYSTEM

Donald H. Breslow, Framingham Center, and Sidney A. Wingate, Concord, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed July 23, 1971, Ser. No. 165,620
Int. Cl. G08c *9/06*; H03k *13/02*
U.S. Cl. 340—347 P 9 Claims



An absolute rotary encoder in which a redundant optical system is located at any one of several angular positions around the encoder disc relative to the original optical system. In the event of failure of a component in the original optical system, the redundant optical system is connected in place of the original optical system. In the embodiment where the redundant optical system is located at 90° away from the original optical system, signals from the redundant optical system are identical to signals from the original optical system for all but the most coarse and second most coarse encoder tracks. Signals from the photodetectors for the most coarse and second most coarse tracks of the redundant optical system

are fed to compensating logic circuits which operate on these signals and yield positional output signals for the most and second most coarse tracks which are identical to positional output signals which would have been produced by the original optical system. In addition a simple logic circuit is provided which recognizes whether the primary or redundant system is connected and then performs the necessary signal switching.

3,725,905

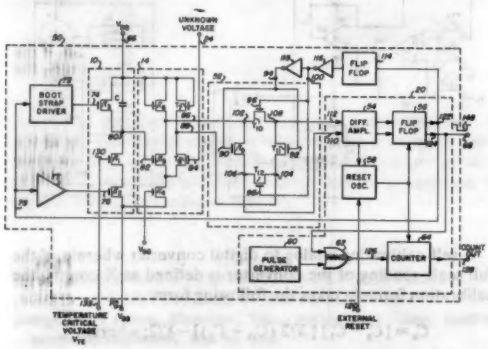
MONOLITHIC ANALOG-TO-DIGITAL CONVERTER

Burton R. Tunzi, 10090 North Blaney, Cupertino, Calif.

Filed Aug. 2, 1971, Ser. No. 168,105

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 AD **8 Claims**



A self- contained fully integrated, monolithic analog-to-digital converter including, a linearized ramp generator for providing a reference voltage, a comparator for comparing the reference voltage to an unknown voltage, one or more differential amplifying stages, a cross-over network for providing semiconductor components mismatch compensation, a flip-flop for generating output pulses having widths proportional to the unknown voltage, and a counter responsive to the flip-flop output for developing a digital output signal commensurate with the unknown voltage.

3,725,906

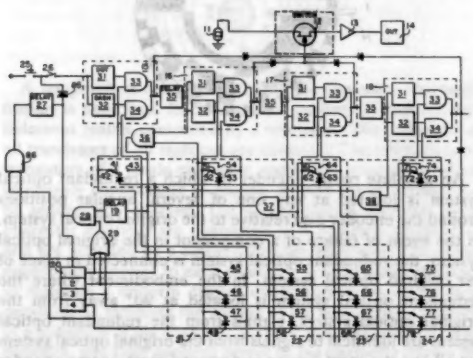
SELF-TIMING CODE KEYER

George R. Quick, Silver Spring, and George R. Sowter, Ashton, both of Md., assignors to The Singer Company, New York, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,212

Int. Cl. G08c *19/22*

U.S. Cl. 340—365 **8 Claims**



This is an automatic code keyer which can be used, for example, for automatically generating in Morse code the call letters of a radio transmitter. The keyer of this invention is simpler and has fewer parts than prior art devices. It comprises a plurality of selection circuits which activate individual dot or dash circuits. In each case where a dot is selected, a short pulse is generated, and if a dash is selected, a long pulse is generated. The generation of a pulse opens a gate which permits a tone to be transmitted to the output for a duration of the pulse. The selection devices are manually controlled and are operated to select the appropriate dot or dash for each element of a desired letter. If neither is selected, the pulse is applied to the next line of selection devices which control the original pulse generators and gating circuits. The system may be expanded to provide for the automatic generation of any number of letters.

3,725,907

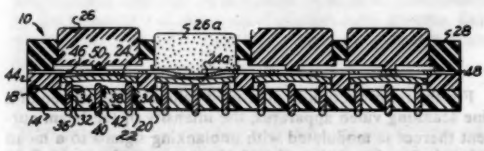
PUSHBUTTON KEYBOARD SYSTEM

Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 1, 1971, Ser. No. 148,503

Int. Cl. H04q *3/00*

U.S. Cl. 340—365 A **17 Claims**



A keyboard system in which a plurality of spaced sets of conductive members including U and rivet shaped are arranged at a surface of a support in electrical communication with conductive paths on an opposite surface of the support. A plurality of actuatable conductive elements, one for each set of conductive members, are provided to establish bridging electrical connection between conductive members of a set upon application of a preselected deflecting force to the conductive elements.

3,725,908

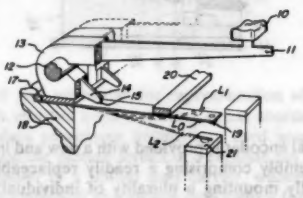
IMPACT TRANSDUCER KEYBOARD APPARATUS

Marcel Brisebarre, Thoiry, and Xavier de Saint Sauveur, Ferney-Voltaire, both of France, assignors to Control Data Corporation, Minneapolis, Minn.

Filed June 21, 1971, Ser. No. 156,146

Int. Cl. H04q *3/00*

U.S. Cl. 340—365 A **6 Claims**

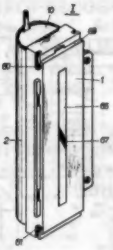


A keyboard apparatus having a plurality of spring-mounted hammers actuated by the key mechanisms is disclosed, where the hammers contact piezoelectric crystals to generate electrical signals when keys are depressed.

3,725,909
ROTATING COIL MAGNETIC INDICATOR

Georg Seibel, Dreieichenhain, Germany, assignor to Schoeller & Co., Frankfurt A.M. Sud, Germany

Filed Feb. 22, 1971, Ser. No. 117,625
Int. Cl. G08b 5/14, 5/22
U.S. Cl. 340—373 R 32 Claims

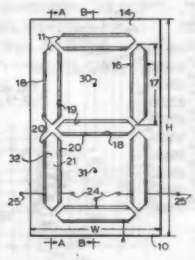


In the indicator disclosed, a coil, rotatably suspended between two pivoting straps,passes through the center of a tubular high coercivity magnet and surrounds the magnet from the center to the outside. The magnet forms a longitudinal gap. The straps are coaxial with the magnet. Current through the coil rotates it so that its outer portion moves peripherally along the magnet. A drum surrounding the magnet and traveling with the coil carries a helical indication. The latter is visible through a gap on a stationary slide indicator. Rotation of the coil moves the visible indication laterally along the gap. The device is suitable for indicating channels or stations on television or radio sets in response to electrical signals.

3,725,910
ELECTRICALLY CONTROLLABLE LIGHT REFLECTING CELL AND MEANS FOR UTILIZATION ON A CHARACTER PRESENTATION DEVICE

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif.

Filed June 18, 1971, Ser. No. 154,298
Int. Cl. G08b 5/36
U.S. Cl. 340—378 R 15 Claims

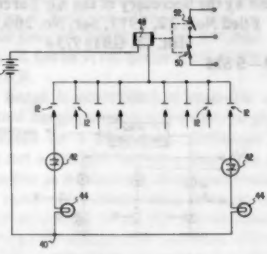


Specified herein is an informational character presentation device utilizing electrically controllable light reflecting cells for allowing light from a common source of light to be converted into an array of light emitting areas on the viewing surface of the device, each area representing a segment with which one or more message characters may be formed. Various embodiments of the light reflecting cell are included in the disclosure, each embodying the principles of a light guide utilizing a series of internal light reflections for the transmission of light to the emitting area thereof.

3,725,911
STOP MOTION DEVICE WITH SELECTIVE INDICATOR

Harold E. Cook, Lanett, and Harold H. Lanier, Fairfax, both of Ala., assignors to Batson-Cook Company, West Point, Ga.

Filed Dec. 15, 1971, Ser. No. 208,096
Int. Cl. G08b 21/00
U.S. Cl. 340—415 5 Claims

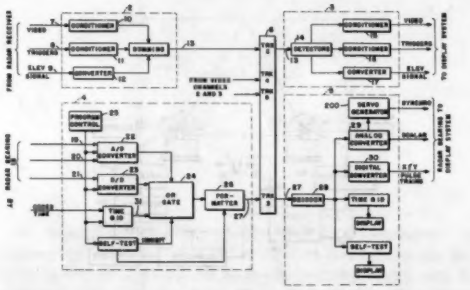


A stop motion system for multi-thread textile machines includes a number of thread slack-detection switches disposed in parallel and each having an indicator lamp and a diode in series with the switch. A voltage source and a stop motion relay are in series with the switches and the voltage source produces a potential through any closed switch and its associated lamp and diode greater than the breakover voltage for the diode. Each diode, however, is a four layer diode so that its sustaining voltage is very much less than its breakover voltage. In this way, the first diode to conduct reduces the potential available across any of the other diodes to the sustaining voltage so that only the first detector circuit activated will be effective to provide an indication of malfunction.

3,725,912
RADAR VIDEO RECORDING SYSTEM

Donald E. Buchholz, Silver Spring; Ronald L. Bakala, Laurel; Robert E. Miller, Ellicott, and Richard W. Pickering, Burtonsville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 17, 1971, Ser. No. 144,103
Int. Cl. G01s 7/02
U.S. Cl. 343—5 PC 15 Claims



A radar data system for recording and replaying radar information for energizing a search radar display unit and having a capability of accommodating a plurality of search radars of either the two-dimensional or three dimensional type. In addition, provision has been made to allow for the variety of signals used to define the search radar position and also for internal fault detection. Also, the system can record and provide command and control signals for external simulators and/or computer systems to perform a wide variety of functions which may be related to the recorded search radar presentations. The system is divided into two primary sections, record

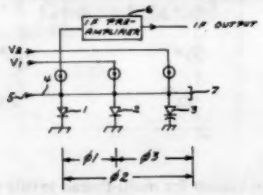
and reproduce, and is further subdivided according to the type of data being recorded on a recorder track.

3,725,913

MICROWAVE SENSITIVITY TIME CONTROL CIRCUIT

Ernest R. Roehl, Anaheim, and Gerald D. Carey, Fullerton, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 22, 1971, Ser. No. 200,719
Int. Cl. G01s 7/34
U.S. Cl. 343—5 SM **2 Claims**



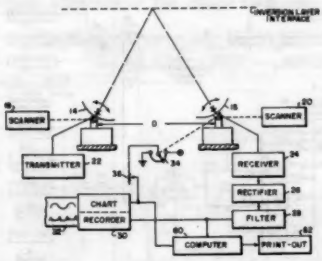
A microwave sensitivity control (STC) circuit for use with a radar receiver is provided in which the STC control element is included as a part of a microwave mixer. STC control diodes are located aft of the microwave mixer diode. The receiver is operated with STC not applied until the target return is sufficiently large to cause the transfer function of the mixer-IF preamplifier to just begin compressing. At this time control bias is applied to the STC diodes which reduces the electric field intensity at the plane of the mixer diode by 25 db as the target returns become larger.

3,725,914

MEASUREMENT OF TEMPERATURE INVERSIONS

Cliff I. Davidson, and Charles F. Laing, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 5, 1971, Ser. No. 140,539
Int. Cl. G01s 9/60
U.S. Cl. 343—5 W **12 Claims**



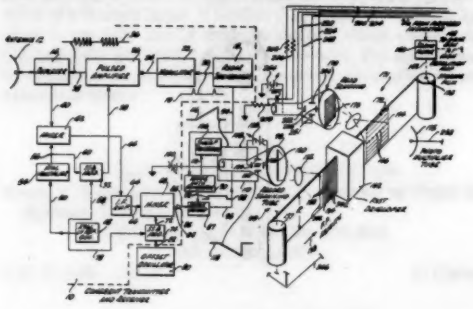
Method and apparatus for measuring the height and strength of the uppermost limit of a temperature inversion with the use of radio-frequency wave energy. This is achieved by using a wavelength which will not be reflected by water droplets and particulate matter in the air but which will be at least partially reflected at the top of an inversion layer due to a change in the index of refraction of the air because of an abrupt change in temperature and density. Preferably, separated transmitting and receiving antennas are used and the height of the uppermost limit of the inversion layer is determined trigometrically.

3,725,915

HIGH RESOLUTION MAPPING SYSTEM

Elvin E. Herman, Pacific Palisades, and Henry L. McCord, San Pedro, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 27, 1960, Ser. No. 78,768
Int. Cl. G01s 9/42
U.S. Cl. 343—5 PC **16 Claims**



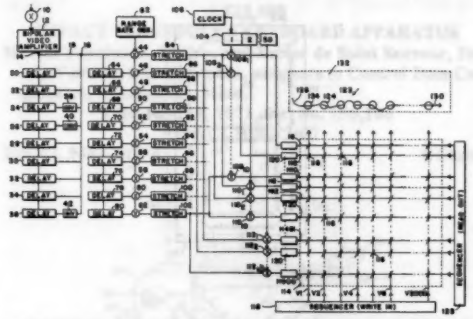
A synthetic array mapping system is disclosed that is operable from a moving craft so as to provide a high resolution map of an area such as a sector of the earth's surface. A coherent side looking redar system is provided in the moving craft to obtain and store varying frequency doppler history components of objects in the area to be mapped. The stored history components are then mixed with a swept oscillator signal. Difference signals developed by this mixing are applied to a narrow-band filter to compare the frequency of the difference signal with a predetermined pass band and develop mapping signals representing objects in a fixed angular position relative to the flight path of the craft.

3,725,916

POST STORAGE RANGE AND DOPPLER CORRELATION METHOD AND APPARATUS

Thomas P. Cutler, Chestnut Hill, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sept. 1, 1967, Ser. No. 665,069
Int. Cl. G01s 9/02; G06f 15/34; G06g 7/19
U.S. Cl. 343—5 DP **20 Claims**



Apparatus is herein disclosed for processing signals by storing and correlating with preset programs. The apparatus is disclosed as it relates to a pulse doppler radar application. Target reflected coded signals modulated by doppler are partly correlated to resolve ranges which are ambiguous with relation to the remaining uncorrelated code. The partly correlated signal is stored in a magnetic core matrix. A series of stitching networks wired (or stitched) in accordance with predetermined range and doppler combinations are coupled to the storage

matrix so that when the signals stored in the matrix are read out to the stitch networks, correlation of the remaining ambiguity will occur indicating unambiguous range and doppler of targets. The stitch networks compare the stored code time histories with the preset codes representing a combined range and doppler signal.

3,725,917

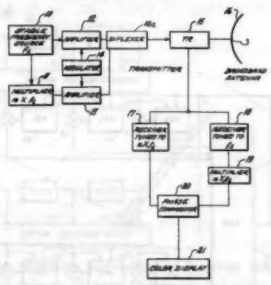
RADAR PHASE COMPARISON METHOD AND SYSTEM FOR OBJECT RECOGNITION

Carlyle J. Sletten, Acton; Allan C. Schell, Richard B. Mack, William B. Goggins, Jr., all of Winchester, and Philipp Blacksmith, Concord, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Jan. 27, 1969, Ser. No. 795,775

Int. Cl. G01s *9/02*

U.S. Cl. 343—55 A **3 Claims**



A radar method and system of object recognition wherein multiple integral coherent-harmonic frequency signals are directed towards the object and the return signals therefrom are phase compared to provide a resultant signal having characteristics distinguishing the object from its background. Also included is a color display for displaying the resultant signal in color to enhance the reflection characteristics of the object.

3,725,918

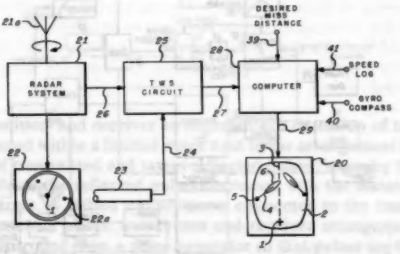
COLLISION AVOIDANCE DISPLAY APPARATUS FOR MANEUVERABLE CRAFT

Herman J. Fleischer, Halesite; Philip Lipsky, Hartsdale, and Bert V. Tiblin, Huntington, all of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 18, 1970, Ser. No. 90,558

Int. Cl. G01s *7/06*

U.S. Cl. 343—5 EM **11 Claims**



Collision avoidance display apparatus that provides indicia representative of present positions of intruding vehicles as well as predicted tracks thereof. Each track terminates in a region representative of the area to be avoided to assure passing the corresponding intruding vehicle by at least a predetermined distance. These displayed indicia provide information for assessing maneuvers to avoid collision with the intruding craft.

3,725,919

METHOD AND APPARATUS FOR PLOTTING VESSEL POSITION

Jerry J. Jones, and Joe C. Lochridge, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Dec. 19, 1969, Ser. No. 886,562

Int. Cl. G01d *9/10*; G01s *5/14*, *11/00*

U.S. Cl. 343—6.5 R **16 Claims**

A pipelaying barge is controlled in response to the error between the actual barge position and a desired pipeline route or course illustrated on a strip map. Although the desired pipeline route is not a straight line on a chart, the strip map illustrates the pipeline as a relatively straighter route or course. The straighter route or course strip map is obtained by plotting the route or course on a chart where relative rotation between adjacent gridline segments has been effected so as to cause the plot of the route on the reoriented gridline segments to assume a straighter form.

3,725,920

DISTANCE MEASURING METHOD AND APPARATUS FOR THE PERFORMANCE THEREOF UTILIZING TWO TR

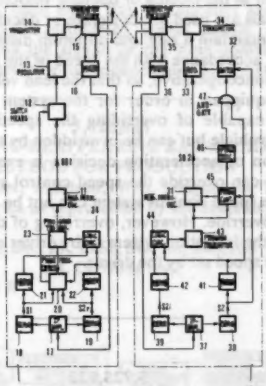
Hanspeter Kupfer, Geroldswil, and Marcel Hossmann, Zurich, both of Switzerland, assignors to Albiswerk Zurich AG, Zurich, Switzerland

Filed Nov. 12, 1970, Ser. No. 88,644

Claims priority, application Switzerland, Nov. 24, 1969, 17435/69

Int. Cl. G01s *9/38*, *9/56*

U.S. Cl. 343—6.5 R **3 Claims**



An apparatus and method for distance measurement by means of two transmitter-receiver devices arranged at the terminal points of the path to be measured and which can be selectively switched as a main- or auxiliary station. The invention contemplates automatically initiating transmission back of a difference signal produced at the auxiliary station upon the appearance of a phase quiescent condition at a measuring frequency control of the auxiliary station, arrival of such transmitted back difference signal at the main station automatically triggering measurement of a corresponding partial measurement result. Upon completion of each partial measurement result the measuring signal of the main station is automatically switched-off, and non-presence of at least one difference signal at the main- and auxilliary stations bringing about continuation of the measurement program to the next

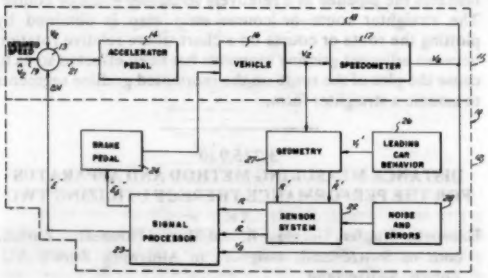
successive measuring frequency and switching-in the measuring signals.

3,725,921

TRAFFIC RESPONSIVE SPEED CONTROL SYSTEM

Joseph S. Weidman, Walled Lake; Henry C. Yee, Royal Oak; Jack G. Elliott, Farmington, and Zaven Margosian, Birmingham, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 4, 1970, Ser. No. 86,922
Int. Cl. G01s 9/04, 9/46
U.S. Cl. 343—7 ED **30 Claims**



A system for automatically adjusting the speed of a vehicle to existing traffic conditions is described. The system functions in conjunction with an automatic speed control system to maintain a safe following distance between vehicles traveling in the same direction. A range and range-rate sensor generates signals which are indicative of the distance between the vehicles, as well as the closing or opening velocity of the vehicles. These signals are used to accelerate or decelerate the trailing vehicle to maintain a safe and optimum distance between the vehicles in accordance with the speed of the lead vehicle. The system is noncooperative, so that the lead vehicle need not be similarly equipped in order for the system to operate. The system is capable of overriding the speed control system within the vehicle but can be overridden by the driver when a deceleration or acceleration decision is executed. Although the system can override the speed control system, the speed set into the speed control system can not be exceeded except by driver override. However, overriding of the speed control system by the invention system or by driver override does not destroy the speed set by the driver.

3,725,922

CONVERGENCE RATE IMPROVEMENT FOR ADAPTIVE RECEIVING ARRAY ANTENNAS OF HIGHER ORDER THAN 2-PULSE MTI CANCELLERS

Lawrence E. Brennan, Tarzana, and Irving S. Reed, Santa Monica, both of Calif., assignors to Technology Service Corporation, Santa Monica, Calif.

Filed Sept. 13, 1971, Ser. No. 179,782
Int. Cl. G01s 9/42
U.S. Cl. 343—7 A **6 Claims**

A system for improving the convergence rate of adaptive receiving array antenna systems in MTI radar systems, having cancellers of higher orders than a 2-pulse canceller, is provided by a transformation matrix according to the following technique.

Form the matrix H with elements

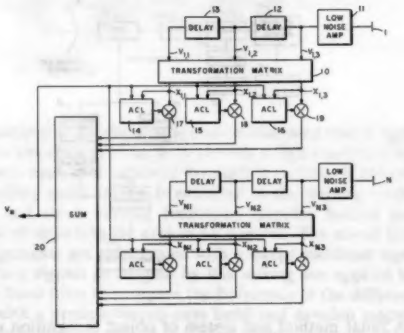
$$H_{mn} = 1 - \epsilon \quad m - n \ ^2$$

where $\epsilon = \log 1/\rho$ and ρ is the correlation between successive returns. The transformation matrix then has the form

$$U = \begin{pmatrix} GFAC & 0 & 0 & . & . & 0 \\ & 0 & 1 & 0 & . & . & 0 \\ & 0 & 0 & 1 & . & . & 0 \\ & . & . & . & . & . & . \\ & 0 & 0 & 0 & . & . & 1 \end{pmatrix} U_1 \begin{pmatrix} 1 & 0 & 0 & . & . & 0 \\ 0 & e^{i\psi} & 0 & . & . & 0 \\ 0 & 0 & e^{i2\psi} & . & . & 0 \\ . & . & . & . & . & . \\ 0 & 0 & 0 & . & . & e^{i(N-1)\psi} \end{pmatrix}$$

$$U_1 \begin{pmatrix} h_1 \\ h_2 \\ h_3 \\ . \\ . \\ h_N \end{pmatrix}$$

where GFAC is a gain factor greater than unity, ψ is a phase shift angle, and $h_1, h_2, \ldots h_N$ are the eigenvectors of H ordered



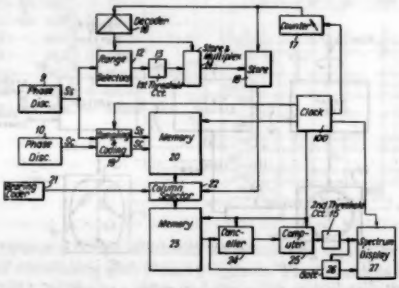
such that the associated eigenvalues are monotically increasing. Antenna element signals V are then transformed according to the equation $X = UV$.

3,725,923

COHERENT DIGITAL PULSE DOPPLER RADAR SYSTEM WITH IMPROVED SIGNAL HANDLING CAPACITY

Henri J. Bosc, Paris 7e; Michel G. M. Castets, Meudon, and Jean-Claude A. Debuisser, 78 Fontenay-le-Fleury, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed July 6, 1971, Ser. No. 159,987
Claims priority, application France, July 7, 1970, 70/25146
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **5 Claims**



A pulse Digital Doppler coherent MTI radar system in which sine and cosine phase detector outputs are both coded and stored in a plurality of range increments. A first channel stores digital codes for moving targets exceeding a minimum

predetermined amplitude threshold. That information is used to control another MTI channel to reduce the number of target signals which must be processed in a second channel, thereby providing increased processing time. Storage of signal codes is effected in dual memories, one being read while real time storage is carried out in the other.

The sine and cosine phase detector output processing facilitates derivation of target velocity and sense. A Fourier transform display depicts Doppler component content in selected signals, the latter being controlled by bearing as well as range increment data.

3,725,924

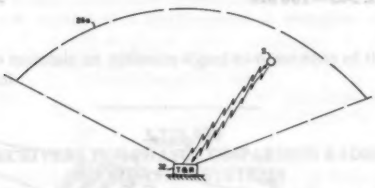
INTERMITTENT CW SYSTEM FOR SATELLITE SURVEILLANCE

Roger L. Easton, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 22, 1970, Ser. No. 56,031

Int. Cl. G01s 9/04

U.S. Cl. 343—10 **8 Claims**



An electronic satellite surveillance system wherein transmitters and receivers are located at the same sites and wherein the transmitted signals consist of multifrequency, intermittent, CW electromagnetic energy which is radiated in narrow fan patterns and wherein the receivers include means which allow unambiguous angle and range determination.

3,725,925

TRANSMITTER- AND RECEIVER ARRANGEMENT FOR DETECTION OF TARGETS WITHIN A LIMITED RANGE NEXT TO THE ARRANGEMENT

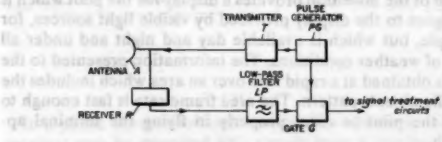
Nils Erik Borje Holmgren, Goteborg, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Nov. 4, 1970, Ser. No. 86,800

Claims priority, application Sweden, Nov. 6, 1969, 15233/69

Int. Cl. G01s 7/28

U.S. Cl. 343—17.1 R **3 Claims**



Transmitter- and receiver arrangement for detection of targets situated within a limited range next to the arrangement by means of transmitted and target reflected pulses, whereby the amplitude of the reflected pulses decreases with the distance to the target. A pulsed transmitter is connected to the transmitter antenna of the transmitter and receiver arrangement and is controlled from a pulse generator so that pulses are fed periodically to the transmitter antenna. The pulse generator also controls an on-off circuit in the receiver part of the arrangement, the input of which circuit via a low-pass filter is connected to a receiver which in its turn is connected to a receiver antenna. During a certain short time interval in conjunction with the trailing edge of the transmitted pulse the pulse generator opens the on-off circuit allowing a received signal to be fed to the signal processing circuit of the receiver. By selecting the cut-off frequency of the low-pass filter and the time interval during which the gate is open in a suitable manner a compensation of the distance dependent amplitude of the echo signal can be achieved.

3,725,926

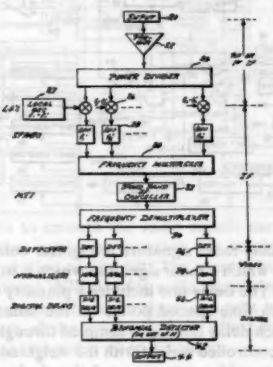
FREQUENCY DIVERSIFIED RADAR SYSTEM

Manuel Ares, Manlius, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force

Filed March 11, 1969, Ser. No. 808,038

Int. Cl. G01s 9/02

U.S. Cl. 343—17.5 **2 Claims**



A frequency diversity moving target indicator radar system utilizing a combination of coherent and incoherent processing to improve performance in clutter interference, including a multiple frequency waveform which is processed in a multiple channel receiver and further including a frequency multiplexer, a broad band delay line IF canceller and a demultiplexer. Normalizers producing digital signals, and digital delays for aligning the signals in the time domain combine with a binomial detector to produce target information.

3,725,927

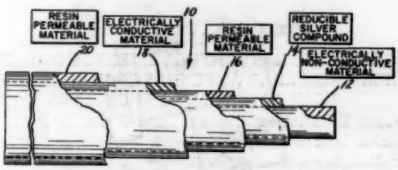
DISAPPEARING-REAPPEARING RADAR CHAFF AND METHOD FOR PRODUCTION

William S. Fiedler, Madison, Wis., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 27, 1962, Ser. No. 248,188

Int. Cl. G01s 7/42

U.S. Cl. 343—18 E **8 Claims**

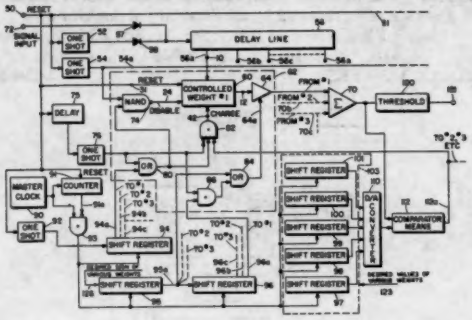


Dispersable radar chaff having the characteristic of intermittently being electrically reflective and non-reflective, and comprising an inert core element progressively surrounded by alternated layers of reducable metallic salt, resin permeable material and oxidizeable metal, the chaff so formed being activated before dispersion by application of an oxidizing-reducing agent, said agent in progressively working its way inward alternately oxidizing a metallic layer to become non-reflective, and reducing a metallic salt layer to become reflective.

3,725,928
DIGITALLY CONTROLLED WEIGHT ADJUSTMENT SYSTEM

Edward George Klimchak, Owings Mills, and Erik Rosenbaum, Randallstown, both of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed March 31, 1971, Ser. No. 129,728
Int. Cl. G01s 9/02
U.S. Cl. 343—55 A **11 Claims**

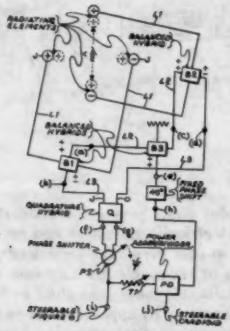


A hyperplane radar signature recognizer consists of a delay line through which a radar signature which is to be classified is propagated. The delay line includes a plurality of time spaced taps at which time spaced points on the radar signature are sampled. Each delay line tap is sampled through an associated electrically controlled weight with the weighted samples being summed to provide a measure of signal classification. The electrically controlled weights are controlled by propagating through the delay line prior to the receipt of the radar signature an amplitude standardized pulse. With all weights disabled so as to present an open circuit to the aforementioned summing network the weights are enabled one at a time in turn, and the output from the summing network compared against a desired weight value. The electrically controlled weight is then adjusted until its value is equal to the desired value. After all the electrically controlled weights have been set to their desired values the signature recognizer is ready to receive the radar signature. The timing logic circuit required to program the adjustment of the electrically controlled weights is also disclosed.

3,725,929
STEERABLE NULL ANTENNA ARRANGEMENT

William M. Spanos, Wayne, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 28, 1971, Ser. No. 157,245
Int. Cl. H01q 3/26
U.S. Cl. 343—844 **27 Claims**

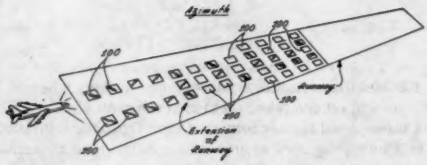


A steerable null antenna arrangement capable of providing cardioid, figure-eight or multinull steerable patterns utilizing electrically optimized phase shifters or resolvers for the steering elements. Via a hybrid feed arrangement a first pattern excitation is developed from two orthogonally arranged pairs of omnidirectional radiators simultaneously with an omnidirectional omniphase reference pattern without the need for a separate sense antenna. The simultaneously generated patterns combine to form a resultant pattern having at least one null (cardioid) which is electrically steerable to any angle in azimuth. Provision is made for varying the azimuthal angular separation of the nulls produced in the resultant pattern.

3,725,930
MICROWAVE RADIOMETRIC AIRCRAFT LANDING ASSIST SYSTEM

Philip J. Caruso, Jr., 15611 Del Prado Drive, Hacienda Heights, Calif.

Filed May 15, 1969, Ser. No. 824,860
Int. Cl. G01w 1/00
U.S. Cl. 343—100 ME **5 Claims**



A microwave radiometric landing assist system is provided which serves as an aid for landing aircraft, for example, and which may complement the present practice of using visible light sources for runway guidance. The landing assist system of the present invention involves the use of passive metallic objects positioned on the ground in a predetermined pattern. These objects are detected by a microwave radiometric receiving system located in the aircraft, and which likewise may be considered passive in that it does not radiate energy from the aircraft. The microwave radiometric landing assist system of the invention provides a display for the pilot which is analogous to the display provided by visible light sources, for example, but which is available day and night and under all types of weather conditions. The information presented to the pilot is obtained at a rapid rate over an area which includes the metallic objects pattern. The area frame rate is fast enough to allow the pilot to react properly in flying the terminal approach.

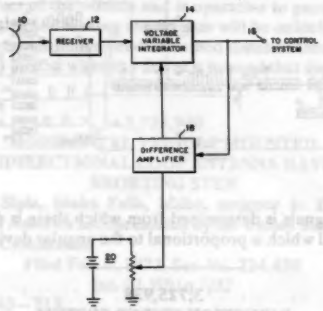
3,725,931
AUTOMATIC INTEGRATOR CONTROL FOR RADIOMETRIC GUIDANCE

Robert P. Moore, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 16, 1971, Ser. No. 134,555
Int. Cl. G01w 1/00
U.S. Cl. 343—100 ME **1 Claim**

A microwave radiometric sensor is provided with a voltage variable integrator controlled by a voltage from a difference

amplifier that compares the integrator output signal with a reference voltage. The reference voltage is established at a



value to maintain an optimum signal-to-noise ratio of the target signal.

3,725,932

RECEIVERS FOR PHASE COMPARISON RADIO NAVIGATION SYSTEMS

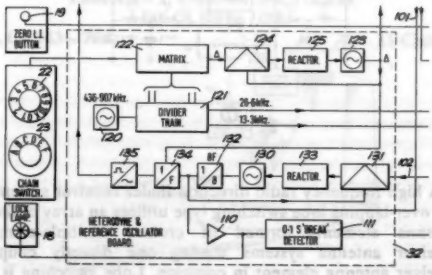
David Geoffrey Hughes, London, England, assignor to Decca Limited, London, England

Filed Nov. 9, 1970, Ser. No. 88,037

Claims priority, application Great Britain, Nov. 10, 1969, 54,973/69

Int. Cl. G01s *1/30*

U.S. Cl. 343—105 R **7 Claims**



In a phase comparison radio navigation system in which a receiver may be operated with signals from a number of different chains of transmitting stations, each chain using radiations on a number of different harmonics nf of a common fundamental frequency f, the different chains using different fundamental frequencies, the receiver is provided with an oscillator and divider chain feeding a syntheizer matrix to form a frequency syntheizer to provide heterodyne signals of frequency $n\Delta$ for changing the frequencies of the received signals from harmonics of f to harmonics of F where F a fixed frequency used in the receiver for all chains. This oscillator and divider chain also provides timing signals for effecting a digital phase comparison between multiple frequency signals radiated in turn for short periods from the various stations to provide lane identification (for resolving ambiguities in the much more highly accurate but ambiguous normal position line determination).

3,725,933

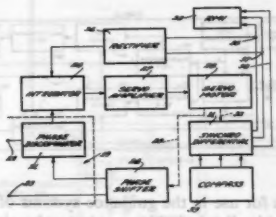
APPARATUS AND METHOD OF SMOOTHING NAVIGATION SIGNALS

Earl Stuart Perkins, Oak Brook, Ill., and James Hobbs, Overland Park, Kans., assignors to Butler National Corporation, Oak Brook, Ill.

Filed Sept. 11, 1970, Ser. No. 71,461

Int. Cl. G01s *1/44*

U.S. Cl. 343—106 R **1 Claim**



It is desirable to smooth the radio signals used in aircraft navigation so that maximum accuracy can be obtained in the control and operation of aircraft. The present invention provides for smoothing VOR bearing radio signals by limiting the maximum excursions which the signal can take in view of the axial parameters of the system and to adjust the maximum response with an integrator when necessary.

3,725,934

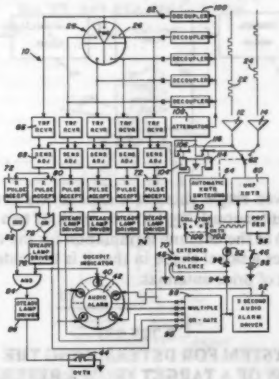
COLLISION WARNING INDICATOR

David L. Ludlow, P.O. Box 342, Oak Harbor, Wash.

Filed May 28, 1971, Ser. No. 147,781

Int. Cl. G01s *3/00, 5/02*

U.S. Cl. 343—112 CA **17 Claims**



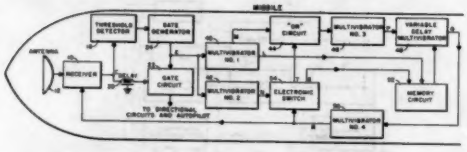
A train of output pulses from a pulse repetition generator is split into two pulse groups for modulating signal energy radiated forwardly and rearwardly from a moving craft in a collision warning system. Receiving antennas arranged in a circumferential sector array on each craft, pick-up signal energy within sector zones, from approaching or overtaken craft to energize directional sector lamps on an indicator panel. Pulse recognizing circuits limit response of the lamps to pulse modulated signal energy in such a manner that a warning is provided only if approaching or overtaken craft are within overlapping sector zones.

3,725,935

LEADING EDGE DISCRIMINATOR CIRCUIT

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 29, 1967, Ser. No. 627,596
Int. Cl. G01s *3/10*
U.S. Cl. 343—114.5 **2 Claims**



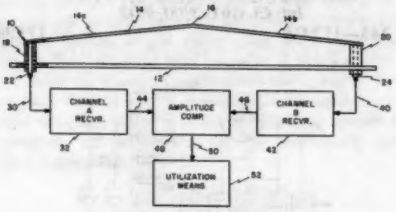
An apparatus for use in the guidance systems of anti-radar missiles to provide discrimination against echo signals when the target is a pulsed radar. It consists of circuits that permit only the leading portion of the first pulse received in each radar cycle to reach the seeker direction sensing circuits.

3,725,936

VHF TRAVELLING WAVE LOOP ANTENNA

Robert P. Sherman, Dix Hills, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 16, 1971, Ser. No. 171,895
Int. Cl. G01s *3/28*
U.S. Cl. 343—119 **1 Claim**



An improved single antenna means serves two channels of an RDF simultaneously by utilizing each of two receivers (or transmitters) as the antenna termination for the other. The antenna features a novel shape in that it is truncated in width to one-half that of prior antennas.

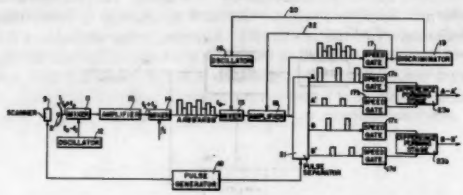
3,725,937

RADAR SYSTEM FOR DETERMINING THE ANGULAR DEVIATION OF A TARGET FROM A REFERENCE LINE

Olaf Schreiber, Ulm/Donau, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm/Donau, Germany

Filed May 25, 1964, Ser. No. 370,126
Claims priority, application Germany, May 25, 1963, T 24057
Int. Cl. G01s *3/16*
U.S. Cl. 343—120 **28 Claims**

A radar system for determining the angular deviation of a target from a reference line. In an exemplary embodiment, an antenna arrangement is switched between at least two states which result in at least two respective radiation patterns having axes of symmetry at an angle to the optical axis of the antenna. The incoming signals are passed through a single receiving channel and are separated, in synchronism with the rate at which the antenna is switched to produce the different radiation patterns. The amplitude relation of successive



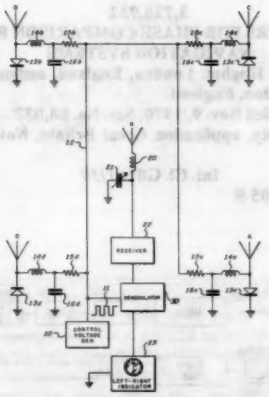
separate signals is determined from which there is derived an error signal which is proportional to the angular deviation.

3,725,938

DIRECTION FINDER SYSTEM

Stanley H. Black, and Richard B. Formeister, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 5, 1970, Ser. No. 77,927
Int. Cl. G01s *3/20*
U.S. Cl. 343—120 **10 Claims**



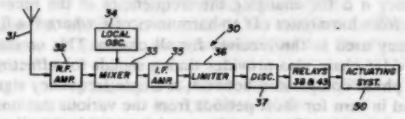
A high frequency radio direction finder receiver system of the over-lapping lobe switching type utilizes an array of lineal antenna elements formed of crossed multiple-element receiver antenna systems sharing one directly coupled receiver antenna element in common. Lobe switching is afforded through bias voltage control of a characteristic of the elements by semiconductor switching circuits.

3,725,939

VEHICLE SECURITY SYSTEM

Julian I. Saltzstein, Cleveland, Tenn., assignor to Sure Lock Systems, Inc., Cleveland, Tenn.

Filed June 7, 1971, Ser. No. 150,509
Int. Cl. H01h *47/20*; H04b *7/00*
U.S. Cl. 343—225 **14 Claims**



A security system for automatically locking and unlocking the door of a vehicle has a radio receiver mounted on the vehi-

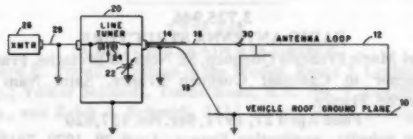
cle, which receiver provides a control signal when the proper RF signal is being received. An actuator responds to the control signal and unlocks the locking mechanism of the door and maintains the same unlocked as long as the control signal is present. A portable radio transmitter is adapted to be carried by the driver of the vehicle and is operative to provide an RF signal, so that the locking mechanism will be unlocked as long as the driver is within a predetermined distance from the door and will be locked when the driver is beyond that distance.

3,725,940

HORIZONTAL VEHICLE MOUNTED OMNIDIRECTIONAL LOOP ANTENNA HAVING A SHORTING STUB

Ralph J. Siple, Idaho Falls, Idaho, assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 8, 1972, Ser. No. 224,490
Int. Cl. H01q *1/32*
U.S. Cl. 343—713 **5 Claims**



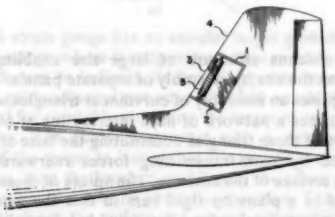
A horizontal rooftop antenna is adapted to be mounted on rolling stock or a highway truck. It is in the form of an end fed shunt-type closed loop radiator tuned to frequencies between 2 and 30 MHz.

3,725,941

HIGH-FREQUENCY NOTCH-EXCITED ANTENNA

Paul F. Stang, Saugus, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed April 2, 1968, Ser. No. 718,034
Int. Cl. H01q *1/28*
U.S. Cl. 343—708 **11 Claims**



A high-frequency, high-power transmitting antenna, suitable for use in aerospace vehicles flying at very high altitudes, is described. The antenna assembly comprises an inductive coil with appropriate tuning capacitors installed within a notch in the airframe. The airframe is used as the radiating element and the matching unit is enclosed in a sealed gas-filled container pressurized to approximately one standard atmosphere for the purpose of inhibiting corona in the region of the current-carrying parts at extremely high altitudes.

3,725,942

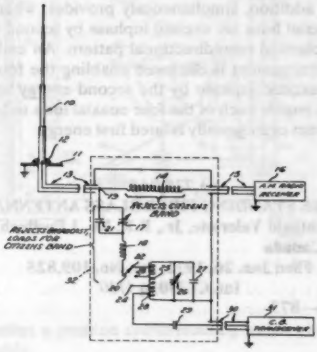
VEHICLE-MOUNTED ANTENNA AND COUPLING CIRCUIT THEREFOR

Milosh L. Ukmar, Euclid, Ohio, assignor to Allen Electric and Equipment Company, Chicago, Ill.

Filed April 22, 1965, Ser. No. 450,027
Int. Cl. H01q *1/34, 5/00, 9/00*
U.S. Cl. 343—715 **15 Claims**

Vehicle-mounted antenna system having a novel coupling circuit connected between the end of an antenna lead-in cable away from the latter's connection to a conventional standard broadcast antenna and a standard broadcast (A.M.) radio receiver and citizens band communications equipment. This coupling circuit:

1. passes standard broadcast signals to the standard broadcast receiver and blocks incoming citizens band signals from this receiver;



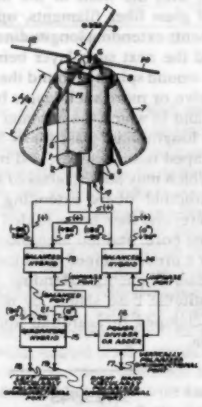
2. passes citizens band signals and blocks standard broadcast signals between the antenna and the citizens band communications equipment;
3. increases the effective electrical length of the antenna for efficient transmission and reception of citizens band signals; and
4. impedance matches the antenna lead-in cable to the citizens band communications equipment.

3,725,943

TURNSTILE ANTENNA

William M. Spanos, Wayne, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 12, 1970, Ser. No. 79,964
Int. Cl. 343 *854;* H01q *21/26*
U.S. Cl. 343—797 **7 Claims**



A multimode turnstile antenna providing simultaneously, without interference, right and left hand circularly polarized omnidirectional patterns and a vertically polarized omnidirectional pattern. Four coaxial cables are disposed vertically and parallel to each other. A frusto-conical member has its smaller diameter end disposed adjacent the upper ends of the coaxial cables to electrically and physically interconnect the outer conductors of all the coaxial cables. This arrangement, when the two pairs of diagonally disposed coaxial cables are excited in a balanced relationship and the pairs are excited

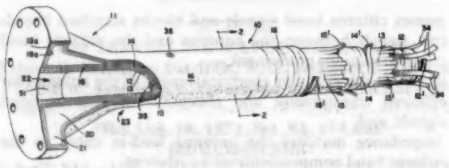
orthogonally by first energy, provides simultaneously both right and left hand circularly polarized omnidirectional patterns. When four members are disposed adjacent the upper half of the coaxial line with each of these members being coupled to the center conductor of a different one of the coaxial lines and extending outwardly at an angle (preferably 90°) with respect to the associated one of the coaxial lines with the members orthogonally related with respect to each other, the antenna, in addition, simultaneously provides, when each of the four coaxial lines are excited inphase by second energy, a vertically polarized omnidirectional pattern. An embodiment of a feed arrangement is disclosed enabling the four coaxial lines to be excited inphase by the second energy and simultaneously to enable each of the four coaxial lines to be excited by the different orthogonally related first energy.

3,725,944

FREE STANDING FIBERGLASS ANTENNA

Michael Archibald Valeriote, Jr., R.R. No. 1 Puslinch, Guelph, Ontario, Canada

Filed Jan. 26, 1971, Ser. No. 109,825
Int. Cl. H01q *1/40*
U.S. Cl. 343—873 **9 Claims**



An antenna which is constructed exclusively of fiberglass, with the sole exception of the electrical conductors, couplings, and upper and lower ends, which may incorporate fiberglass or some other material, which antenna is constructed in a series of lengths, or in a single length in the case of a very short antenna, each of the lengths being essentially of hollow tubular construction, with the walls of the tube made up of alternate layers of glass fiber filaments, one such layer being made up of filaments extending longitudinally along the axis of the antenna, and the next such layer being made up of filaments which are wound spirally around the antenna, anywhere from four to twelve or more such layers being employed one upon the other, and in which the antenna base is constructed with at least the longitudinal glass fibers being formed into a generally bell-shaped base member, and incorporating a reinforcing core of which may be fiberglass or some other material with such longitudinal fibers extending through a central opening in the core, and then being folded backwardly around the exterior of the core, and led alongside the exterior of the antenna itself for a predetermined distance, the exterior of the core and fiberglass filaments extending therearound, being formed into a suitable base shape, by means of an exterior mould which is clamped therearound under pressure during curing of the resin.

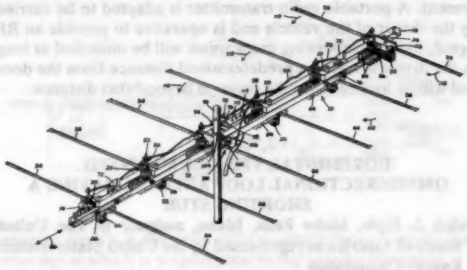
3,725,945

GEARED FOLDING ANTENNA

Lynn L. Lockwood, Burlington, Iowa, assignor to Antennacraft Company, Burlington, Iowa

Filed Feb. 23, 1972, Ser. No. 228,637
Int. Cl. H01q *3/02*
U.S. Cl. 343—882 **10 Claims**

A folding antenna is disclosed comprising a first elongated boom, an antenna element and a means pivotably securing the antenna element to the first boom for movement between retracted and extended positions. A first gear is drivingly coupled to the proximal end of the antenna element and a means for rotating the first gear is longitudinally, slidably coupled to the first boom. The antenna further includes a means for electrically connecting a transmission line to the antenna element and a means for clamping the antenna to a mast.

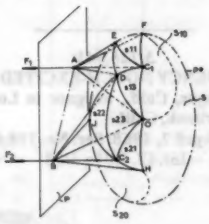


3,725,946

RADIO ANTENNA STRUCTURE

Michel Marie Francois Quequen, St. Nom La Breteche, France, assignor to Camusat Gueguen France, Saint Nam La Bretche, France

Filed April 27, 1971, Ser. No. 137,820
Claims priority, application France, April 29, 1970, 7018535
Int. Cl. H01q *15/14*
U.S. Cl. 343—912 **6 Claims**



Radio antenna structure of large size enabling as easy erection on the site by assembly of separate panels. The structure comprises an assembly of curvilinear triangles whose projection defines a network of lines intersecting at 60°, several assemblies of these triangles constituting the base of pyramids constituted by bars transmitting forces rearwardly of the reflecting surface of the antenna. The apices of these pyramids are united in a plane by rigid bars so that the whole of the structure is completely triangulated and indeformable.

The antenna provided with a radio source lends itself to an installation resisting wind and frost.

3,725,947

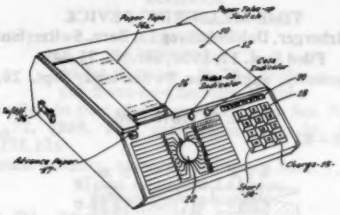
AUTOMATIC TIMEKEEPING AND ACCOUNTING UNIT

Eugene J. Albertini, Tarzana, and Stephen K. Shu, Los Angeles, both of Calif., assignors to Computer Management Systems, Inc., Los Angeles, Calif.

Filed Sept. 30, 1971, Ser. No. 185,055
Int. Cl. G07c *1/10*
U.S. Cl. 346—33 R **8 Claims**

An automatic timekeeping and accounting unit is provided which has particular utility for use by professional persons such as lawyers, accountants and the like. The unit of the invention is intended to be placed on, in, or behind the desk of the user. The unit, in one of its embodiments, contains a columnar printer, a numeric keyboard entry, a functional dial, a columnar device mechanism, operation buttons, and appropriate electronic circuitry. The unit functions automatically to record a client's identifying number, a work activity

code number, and the time spent at the particular work, as well as other appropriate data. A record is then made on a paper tape, or on a magnetic tape cassette, which is used to



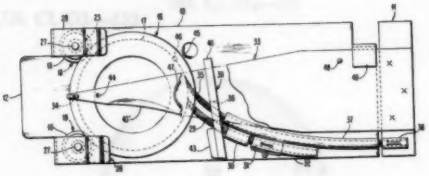
make up statements, or other appropriate reports. This latter function may be carried out by the subscriber himself, or by a central data processing office.

3,725,948

SCRATCH STRAIN RECORDER

Richard H. Prewitt, Cottage in the Woods, Route 3, Lexington, Ky.; Volker Schmidt, Todds Road, R.R. No. 7, Lexington, Ky., and Erich A. Schmidt, 2415 Liberty Road, Lexington, Ky.

Filed June 28, 1971, Ser. No. 157,187
Int. Cl. G01d *15/02*
U.S. Cl. 346—77 **14 Claims**



A scratch strain gauge has an annular target guided into its recording position where it cooperates with a scratch element on a scratch arm to indicate strains of opposite senses. The gauge has a guide adjacent one edge of a plate on which rollers are mounted for rotatably mounting the target in cooperation with brushes. The guide cooperates with a groove in the periphery of the target to insure that the groove receives one of the rollers, then the brushes, and finally the other roller as the target is inserted into its recording position. Ears, which are disposed above the rollers and extend outwardly beyond the rollers to overlie portions of the target when the target is in its recording position, aid in insuring that the target is seated on the roller tongues when disposed in its recording position.

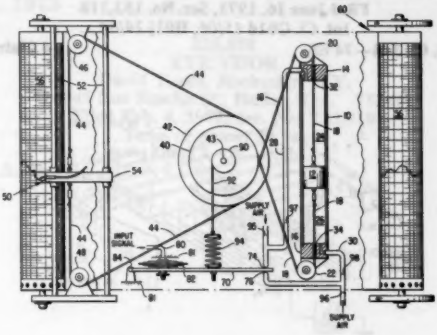
3,725,949

PNEUMATIC INSTRUMENT SERVOMECHANISM

Leslie E. Friedline, Mentor; Thomas E. Stevenson, Willoughby Hills, and Lee A. Weber, Mentor, all of Ohio, assignors to Bailey Meter Company, Croydon, Surrey, England

Filed Jan. 3, 1972, Ser. No. 214,676
Int. Cl. G01d *5/42*
U.S. Cl. 346—72 **10 Claims**

A pneumatic servomechanism having a piston within a cylinder and fluid connections to the cylinder to introduce fluid pressure against either end of the piston so as to position the piston within the cylinder proportional to the difference in fluid pressure caused by a change in an input variable. A pulley system is attached to the piston by means of a cord connected to both ends of the piston and is proportionately rotated by the piston movement. A vane-nozzle differential fluid couple responsive to the rotation of the pulley system nulls the difference in pressure across the piston when the



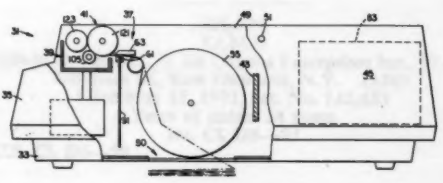
piston reaches a position corresponding to the change in the input variable.

3,725,950

ELECTROSTATIC PRINTING APPARATUS

Reginald T. Lamb, Mountain View, Calif., assignor to Bausch & Lamb Incorporated, Rochester, N.Y.

Filed Nov. 17, 1969, Ser. No. 877,128
Int. Cl. G01d *15/06;* **G03g** *15/10*
U.S. Cl. 346—74 ES **18 Claims**



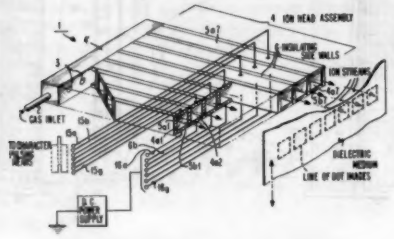
A printing machine, of the kind in which data is printed on sheet material at a printing station by electrostatically charging selected areas of the sheet to attach pigmented particles to the selected areas, includes two rows of opposed and linearly aligned electrodes at the printing station. One row of electrodes is a row of stylus electrodes with the electrodes divided into groups having the same number of electrodes in each group. Each group is further divided into an odd block and an even block of electrodes with the same number of electrodes in each block. The other row of electrodes is a row of segment electrodes with each segment having a length equal to the length of one block of stylus electrodes. The row of segment electrodes is offset with respect to the stylus electrodes in a manner such that an even segment electrode and an odd segment electrode are associated in a pair with each block of stylus electrodes. Corresponding stylus electrodes in each group are connected together by a common supply line or highway. The voltage as supplied to either a stylus electrode or a segment electrode is insufficient by itself to produce a charge on the sheet; but when the voltage supplied to a stylus electrode is combined with the voltage supplied to an opposed segment electrode, a charge is produced on the sheet. This division of the voltage and this method of associating paired segments with each block of stylus electrodes are used to control the selective charging of areas of the sheet along the line of the opposed rows of electrodes.

3,725,951

ELECTRO-IONIC PRINTING

Robert E. McCurry, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 16, 1971, Ser. No. 153,718
Int. Cl. G01d 15/06; H01j 29/84
U.S. Cl. 346—74 ES 4 Claims



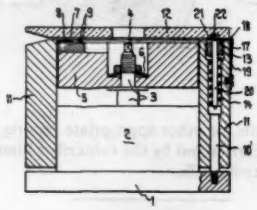
A method of forming electrostatic images on a dielectric surface by controlling the relative ion concentration in a gas stream moving through a channel and directed upon said dielectric surface. Application of an electric field across the channel enables the stream to vary in ion concentration so as to cause the formation of a desired linear charge configuration on the dielectric. Selective application of electric fields to an array of channels causes formation of desired image charge configurations on the dielectric surface.

3,725,952

TIME-MEASURING DEVICE

Werner Sulzberger, Dahlholzliweg 13, Bern, Switzerland

Filed Sept. 11, 1970, Ser. No. 71,449
Claims priority, application Switzerland, Sept. 20, 1969, 14166/69
Int. Cl. G07c 1/06
U.S. Cl. 346—82 9 Claims



A time-stamp clock for marking a time card comprising a timepiece mechanism in driving relation with a rotatable stamp having at least one time mark, and means for positioning a time card relative to said stamp to enable marking at different times on said card with the time marks disposed substantially in registry thereon.

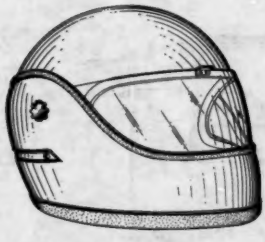
DESIGNS

APRIL 3, 1973

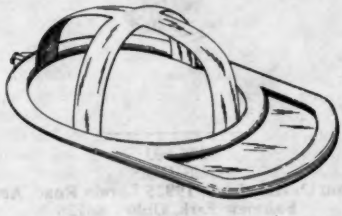
226,595
HAM PRODUCT
Andre Caunes, F 74-Langin, par Bons-en-Chablais, France
Continuation-in-part of design application Ser. No. 18,800, Aug. 22, 1969. This application Aug. 26, 1971, Ser. No. 175,126
Claims priority, application France Mar. 7, 1969
Term of patent 14 years
Int. Cl. D1—*04*
U.S. Cl. D1—26

226,596
HELMET
Eitaro Kamata, Tokyo, Japan, assignor to Shoei Kakoh Co., Ltd., Tokyo, Japan
Filed June 16, 1971, Ser. No. 153,924
Claims priority, application Japan Dec. 17, 1970
Term of patent 3½ years
Int. Cl. D2—*03*
U.S. Cl. D2—232

226,597
HELMET
Eitaro Kamata, Tokyo, Japan, assignor to Shoei Kakoh Co., Ltd., Tokyo, Japan
Filed July 1, 1971, Ser. No. 159,086
Claims priority, application Japan Apr. 20, 1971
Term of patent 3½ years
Int. Cl. D2—*03*
U.S. Cl. D2—232



226,598
EYE VISOR
David Yeeda, Rochester, N.Y. (14045 Los Sancho St., Dallas, Tex. 75240)
Filed Feb. 4, 1972, Ser. No. 223,810
Term of patent 14 years
Int. Cl. D2—*203*
U.S. Cl. D2—247

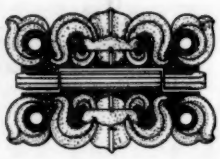


226,599
TABLE
Edwin D. Charles, % Ed Charles Enterprises Inc., 27–28 Gillmore St., East Elmhurst, N.Y. 11369
Filed May 11, 1971, Ser. No. 142,433
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—20

226,600
TABLE
Edwin D. Charles, % Ed Charles Enterprises Inc., 27-28 Gillmore St., East Elmhurst, N.Y. 11369
Filed May 11, 1971, Ser. No. 142,435
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—20

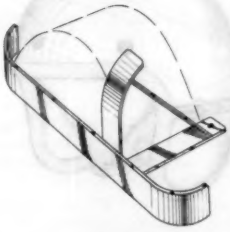
226,601
CUSHION
William O. Klotzbach, 19925 Lorain Road, Apt. 6, Fairview Park, Ohio 44126
Filed Mar. 15, 1972, Ser. No. 235,099
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

226,602
HINGE
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Jan. 3, 1972, Ser. No. 215,242
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—191

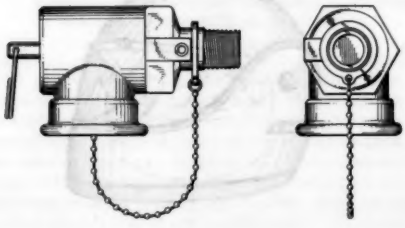


226,603
FOLDING TABLE FOR CLEANING FISH AND SMALL GAME
Leonard Burton Knighten, 2424 N. Piedras St., El Paso, Tex. 79930
Filed Mar. 23, 1970, Ser. No. 22,020
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D11—1

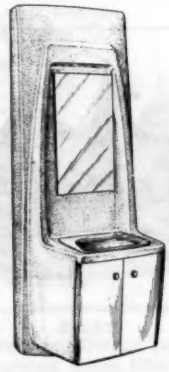
226,604
BRACKET FOR CENTERING A CAMPER UNIT WITHIN A TRUCK BED
Carl G. Henson, 3063 Webster St., Eugene, Oreg. 97402
Filed May 6, 1971, Ser. No. 141,070
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6 A



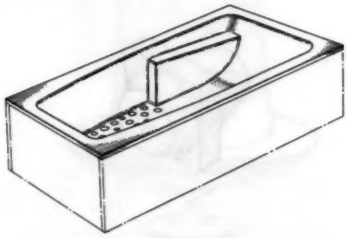
226,605
PRESSURE RELIEF VALVE
Frederick J. Brindisi, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.
Filed Jan. 20, 1972, Ser. No. 219,602
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



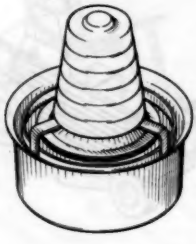
226,606
BATHROOM VANITY UNIT
Myron J. Ament, Bethel Park, Pa., assignor to Wallace-Murray Corporation, Pittsburgh, Pa.
Filed July 27, 1971, Ser. No. 164,491
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



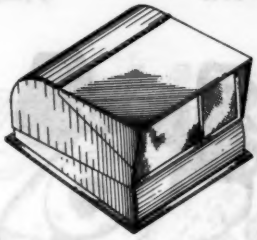
226,607
BATHTUB
William J. Lawrence, Van Nuys, Calif., assignor to Gruber Systems Inc., North Hollywood, Calif.
Filed May 11, 1971, Ser. No. 142,429
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



226,608
HUMIDIFIER
Robert T. Martin, 1708 East 4800 South, Salt Lake City, Utah 84117
Filed Sept. 1, 1971, Ser. No. 177,193
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—146

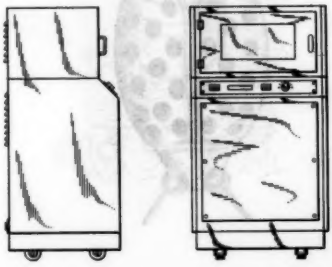


226,609
ENCLOSURE FOR ROOF MOUNTED APPARATUS
Hilton H. Drew, 559 S. Ridge St., Mesa, Ariz. 85204
Filed May 7, 1971, Ser. No. 141,461
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—153



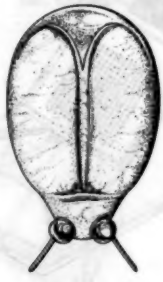
226,610
ELECTRICAL TEACHING UNIT
Robert E. Aumann, Iron Ridge, Wis., assignor to Enrichment Reading Corporation of America, Inc., Iron Ridge, Wis.
Filed Sept. 10, 1971, Ser. No. 179,621
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R

226,611
NUMERICAL CONTROL MACHINE
Warren Ponemon, Oyster Bay, N.Y., assignor to Autonumerics, Inc., Westbury, N.Y.
Filed Aug. 18, 1971, Ser. No. 172,952
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



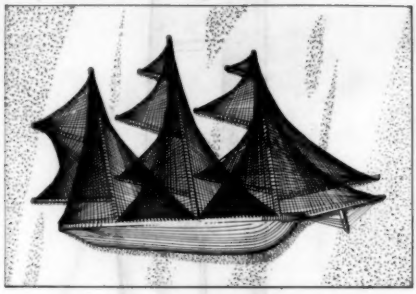
226,612
TELEPHONE COVERS
Barbara H. Robinson, 9955 Miraflores Drive, Baton Rouge, La. 70815
Filed Apr. 29, 1971, Ser. No. 138,849
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

226,613
DECORATIVE ORNAMENT
Jay T. Stauffer, Lititz, Pa., assignor to Wilton Brass Company, Columbia, Pa.
Filed June 18, 1971, Ser. No. 154,483
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 B



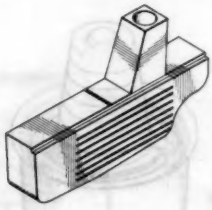
226,614
DECORATIVE ORNAMENT
Jay T. Stauffer, Lititz, Pa., assignor to Wilton Brass Company, Columbia, Pa.
Filed June 18, 1971, Ser. No. 154,482
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 B

226,615
SHIP MODEL WALL PLAQUE
Francis R. Nartowicz, 204 Fort Worth St., Hampton, Va. 23369
Filed Aug. 20, 1971, Ser. No. 173,741
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A



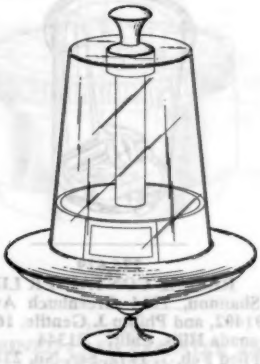
226,616
RESILIENT BALL FOR A TWIRLING BATON
John F. Hale, 3729 Greenbay Drive 45415, and Frederick J. Miller, 2150 E. Rahn Road 45440, both of Dayton, Ohio
Filed May 21, 1971, Ser. No. 145,997
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BC

226,617
PUTTER HEAD
John Dohan, Jr. 11111 Violett Drive, Garden Grove, Calif. 92640
Filed July 1, 1971, Ser. No. 159,102
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

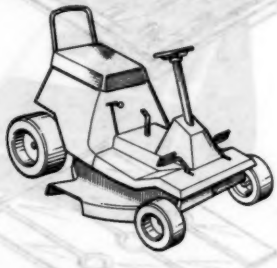


226,618
INFANT'S RIDING TOY
Leonard M. Dvorin, Beechurst, N.Y., assignor to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Aug. 9, 1971, Ser. No. 170,409
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

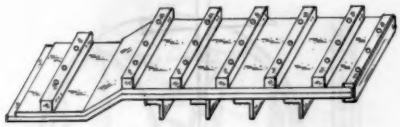
226,619
TOY SPINNING TOP
Herbert A. Plassmann, Bryan, Ohio, assignor to The Ohio Art Company, Bryan, Ohio
Filed Aug. 20, 1971, Ser. No. 173,712
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 CC



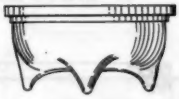
226,620
RIDING MOWER
Mario F. Fernandez and Robert L. Rydeen, St. Paul, Minn., assignors to Toro Manufacturing Corporation, Minneapolis, Minn.
Filed Aug. 30, 1971, Ser. No. 176,437
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 B



226,621
VEHICLE TRACTION BOARD
Louis Bartman, 7227 Horrocks St., Philadelphia, Pa. 19149
Filed Dec. 29, 1971, Ser. No. 213,802
Term of patent 14 years
Int. Cl. D12—*05, 99*
U.S. Cl. D41—1 C



226,622
COVERED DISH OR SIMILAR ARTICLE
Norman L. Chapman, Lincolnwood, Ill., assignor to National Portion Control, Inc., Chicago, Ill.
Filed Sept. 7, 1971, Ser. No. 178,530
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15 A

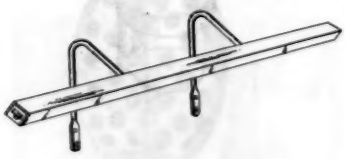


226,623
HOLDER FOR A BEVERAGE CONTAINER OR THE LIKE
Grady W. Shuford, Forest City, N.C., assignor to HHS Investors, Inc., Forest City, N.C.
Filed July 29, 1971, Ser. No. 167,546
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—21 A

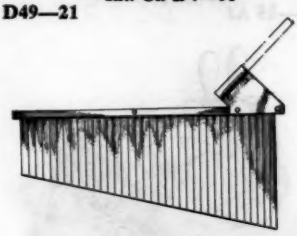
226,624
CROSS
William T. Maze, 105 Middle St., Greenwood, Ind. 46142
Filed Jan. 4, 1972, Ser. No. 215,448
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 B

226,625
LUMINAIRE LENS
Ian Lewin, Newark, Ohio, assignor to Holophane Company, Inc., New York, N.Y.
Filed July 16, 1971, Ser. No. 163,181
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A

226,626
ARTIST'S LIGHT
Carl A. Sundstrom, deceased, late of Torrance, Calif.; by Carl C. Sundstrom, administrator, 1700 Via Arriba, Palos Verdes Estates, Calif. 90274
Filed July 15, 1971, Ser. No. 163,125
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

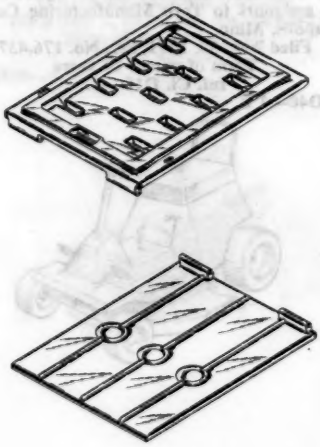


226,627
BROOM HEAD OR THE LIKE
Milan J. Mylan, 974 Haverford Ave., Pacific Palisades, Calif. 90272
Filed July 12, 1971, Ser. No. 161,407
Term of patent 3½ years
Int. Cl. D4—*01*
U.S. Cl. D49—21

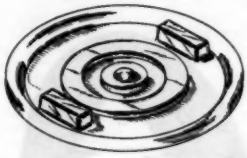


226,628
REFUSE CONTAINER
James L. Shannon, 7914 Greenbuch Ave., Van Nuys, Calif. 91402, and Phillip J. Gentile, 16301 Knollwood Ave., Granada Hills, Calif. 91344
Filed Feb. 7, 1972, Ser. No. 224,379
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—30

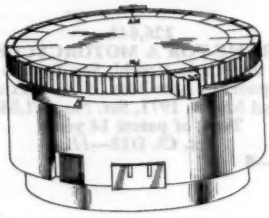
226,629
REFUSE CONTAINER LID
James L. Shannon, 7914 Greenbuch Ave., Van Nuys, Calif. 91402, and Phillip J. Gentile, 16301 Knollwood Ave., Granada Hills, Calif. 91344
Filed Feb. 7, 1972, Ser. No. 224,394
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—35



226,630
REFUSE CONTAINER CLOSURE
Phillip J. Gentile, 16301 Knollwood Ave., Granada Hills, Calif. 91344, and James L. Shannon, 7914 Greenbuch Ave., Van Nuys, Calif. 91402
Filed Feb. 7, 1972, Ser. No. 224,397
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—35

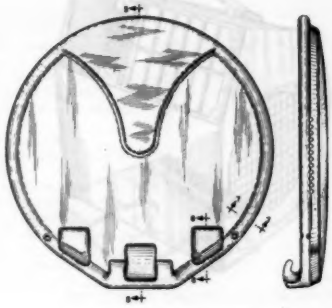


226,631
TIMER
Jack F. Baker, Glenview, and Robert W. Fee, Oak Park, Ill., assignors to AMF Incorporated
Filed May 5, 1971, Ser. No. 140,649
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D42—7 R



226,632
COMBINED CASH REGISTER AND DATA TERMINAL
Randall D. Jackson, Cincinnati, Ohio, assignor to Comp-Acct, Inc., Cincinnati, Ohio
Filed Apr. 29, 1971, Ser. No. 138,853
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—4 A

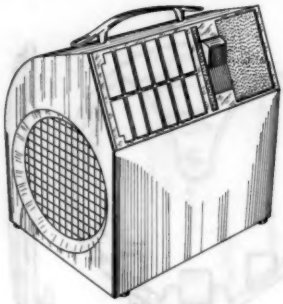
226,633
WATER SLED
Nevitt S. Beck, 260 Bonnett St. SW., North Canton, Ohio 44720
Filed July 26, 1971, Ser. No. 165,884
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D71—1 CC



226,634
CATAMARAN HULL
Paul F. Swenson, Sr., and Paul F. Swenson, Jr., Cleveland, and David D. Dennis, Wickliffe, Ohio, assignors to Great Lakes Sports Mfg. Company
Filed Aug. 31, 1971, Ser. No. 176,800
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D71—1 BB

226,635
HYDROTHERAPY APPARATUS
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Incorporated
Filed Mar. 27, 1972, Ser. No. 238,751
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 T

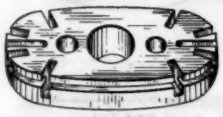
226,636
HAIR DRYER
George A. Van Doren, Jr., 5716 View Lane, Edina, Minn. 55436
Filed Jan. 21, 1972, Ser. No. 219,922
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



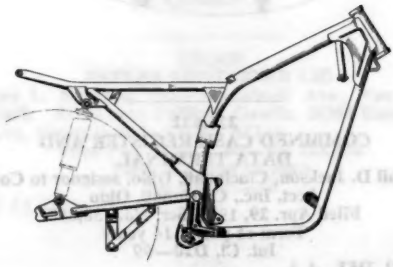
226,637
FABRIC POCKETBOOK
Margo Jeanette Rauch, 1657 E. 19th St., Brooklyn, N.Y. 11229
Filed May 10, 1971, Ser. No. 142,107
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—3 F

226,638
POCKETBOOK
Henry C. White, 67 Green Hill Road, Springfield, N.J. 07081
Filed Jan. 14, 1972, Ser. No. 218,050
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—3 A

226,639
UMBRELLA CROWN
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec Canada
Continuation-in-part of abandoned design application Ser. No. 24,600, Aug. 20, 1970. This application Aug. 10, 1971, Ser. No. 170,677
Claims priority, application Germany Feb. 20, 1970
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 A



226,640
FRAME FOR A MOTORCYCLE
Ramo Vecchi and Carlo Vecchi, San Bartolo Nancalpan, Mexico, assignors to Acer-Mex., S.A., Mexico, Mexico
Filed May 6, 1971, Ser. No. 141,084
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D90—8



226,641
TIRE
Anthony M. Mills, Sutton Coldfield, England, assignor to Dunlop Limited, Erdington, Birmingham, England
Filed July 30, 1971, Ser. No. 167,889
Claims priority, application Great Britain Feb. 8, 1971
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D90—20 R

226,642
SAFETY RAZOR HEAD GUARD
Ted L. Ferrier, Jr., P.O. Box 1451, Dallas, Tex. 75221
Filed May 26, 1971, Ser. No. 147,279
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3D DAY OF APRIL, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Fuller, Sterritt R., Jr.; Munzel, Howard E.; and Woosley, Kenneth D., to International Business Machines Corporation. Coated carrier particles with magnitude of triboelectric charge controlled and method of making same. 3,725,118, Cl. 117-100.00m.

Martin-Marietta Corporation: *See—*
Peppler, Richard B.; and Rosskopf, Philip A., 3,725,097.

Wavetek: *See—*
Naive, Joel A.; and Van Benschoten, Peter J., 3,725,782.

AB Cator & Celsius: *See—*
Eriksson, Folke, 3,724,660.

AB Cold Bound Pellets: *See—*
Kihlstedt, Per Gudmar, 3,725,032.
Kihlstedt, Per Gudmar, 3,725,033.

AB Sveriges Forenade Trikafabriker: *See—*
Eng, Kjell; and Salomonsson, Sven-Olof, 3,724,284.

Abbott Laboratories: *See—*
Beck, Karl Maurice, 3,725,323.
Freiberg, Leslie Alan, 3,725,385.
Von Esch, Anne Mary; and Crovetti, Aldo Joseph, 3,725,424.

Abbratozzato, Salvatore R.: *See—*
Leimbach, Wendell B.; Marshall, James W.; and Abbratozzato, Salvatore R., 3,725,707.

Abe, Iwao: *See—*
Kawano, Akira; Sakakibara, Kozo; Abe, Iwao; and Chonan, Takayuki, 3,725,472.

Abe, Toshiro: *See—*
Kojima, Kiyoshi; and Abe, Toshiro, 3,725,820.

Abitibi St. Anne Paper Ltd.: *See—*
Zehavi, Samuel; Boivin, Joseph J. R.; Hamilton, Douglas D.; and Ranzenhofer, Raoul, 3,724,518.

Acepcion, Antonio T.: *See—*
Malabanan, Alejandro L.; and Acepcion, Antonio T., 3,724,006.

Acme Visible Records, Inc.: *See—*
Tomlinson, Charles W., 3,724,743.
Wood, Hamilton L., 3,724,793.

Adaks Products Incorporated: *See—*
Heen, Helge K., 3,725,205.

Adams, Don L.; and Cotton, Louis S., to United Aircraft Corporation. Aircraft ground speed control system. 3,724,786, Cl. 244-77.00g.

Adams Industries: *See—*
Tilp, George E., 3,725,641.

Adams, Jack J., to Dow Chemical Company, The. Process for polymerizing styrene and maleic anhydride. 3,725,360, Cl. 260-78.50r.

Adams, Nicholas S.: *See—*
Lindner, Ronald J.; Lindner, Allen J.; and Adams, Nicholas S., 3,724,116.

Adams, William J., Jr., to FMC Corporation. Convertible track system for wheeled vehicle. 3,724,580, Cl. 180-9.200.

Adamson, Donald; and Arthur, Frank Henry, to Envopak Limited. Security sealing device. 3,724,890, Cl. 292-322.000.

Addmaster Corporation: *See—*
Takenaka, George, 3,724,309.

Addressograph-Multigraph Corporation: *See—*
Masiello, Felix R., 3,724,945.
Scopp, Howard A., 3,725,184.

Adkins, William B.; Bauer, Thomas F.; and Beane, James O., to Borden, Inc. Method for producing foundry molds and foundry molding compositions. 3,725,333, Cl. 260-38.000.

Adler, Franklin P., to Pullman Transport Leasing Company. Discharge arrangement for railway hopper cars. 3,724,909, Cl. 302-52.000.

Adler, Karl-Heinz, to Bosch, Robert, G.m.b.H. Fuel injection regulator for internal combustion engines. 3,724,430, Cl. 123-32.0ea.

Adolf, Johann Ditrich: *See—*
Mayr, Anton; Wagener, Kurt; Adolf, Johann Ditrich; Pette, Heinrich; and Petzoldt, Klaus, 3,725,542.

Aero Vac Corporated, mesne: *See—*
Santeler, Donald J., 3,724,169.

Aerojet-General Corporation: *See—*
DePree, David O., 3,725,259.
Erwin, Rudy, 3,725,055.

Aeroquip Corporation: *See—*
Cooke, Gerhart M., 3,724,503.
Love, Fred W.; and Hunt, William J., 3,725,167.

AGA Aktiebolag: *See—*
Ekstrom, Stafan Walter, 3,724,482.
Niss, Erik, 3,724,950.
Unger, Hans Peter Olof; Westberg, Eric J. H.; and Schwartz, Stephan L., 3,724,747.

Agfa-Gevaert Aktiengesellschaft: *See—*
Knapp, Walter; and Schneider, Othmar, 3,724,946.
Kuffner, Karl; and Proeschel, Ernst, 3,725,077.
Paulus, Rudolf, 3,724,947.

Agfa-Gevaert N.V.: *See—*
Verhille, Karel; and Conix, Andre Jan, 3,725,061.

Ahlborn, John C.: *See—*
Slater, William L.; and Ahlborn, John C., 3,725,020.

Ahlquist, Harry Richard, to Erie Development Company. Adjustable skip bridge valving mechanism for disc filter. 3,724,668, Cl. 210-331.000.

Air Factors, Inc.: *See—*
Lambert, Robert R., 3,724,356.

Air L.B: *See—*
Blanchet, Lucien, 3,725,852.

Air Preheater Company Inc., The: *See—*
Krumm, Eugene D., 3,724,401.

Air Products & Chemicals, Inc.: *See—*
Mc Kinney, Ross E., 3,724,667.

Air Products and Chemicals, Inc.: *See—*
Jones, Robert D., 3,725,040.
Spector, Marshall L.; Jones, Robert D.; and McDowell, Curtis S., 3,725,258.

Aisin Seiki Kabushiki Kaisha: *See—*
Kobashi, Uichiro; and Kito, Masahiro, 3,724,210.
Kobayashi, Toyoaki, 3,724,606.

Aizawa, Tatsuo: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,725,066.

Akizuki, Kosuke: *See—*
Mayuzumi, Harutaka; Shinoda, Motoyuki; and Akizuki, Kosuke, 3,724,046.

Aktiebolaget Bofors: *See—*
Simmons, Bjorn Herman Olof, 3,724,380.

Aktiebolaget Electrolux: *See—*
Leinfelt, Karl Eric, 3,724,179.

Aktiebolaget Hassle: *See—*
Brandstrom, Arne Elof; Gustavii, Klas Ragnar; Junggren, Ulf Krister; and Kylberg, Kerstin, 3,725,006.

Aktiebolaget Svenska Flaktfabriken: *See—*
Widerby, Lennart, 3,724,886.

Aktiebolaget Tudor: *See—*
Andersson, Johan B.; and Lindbergh, Karl E. E., 3,725,130.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Bolliger, Andre, 3,725,750.

Alber, Hans. Flow regulating valve. 3,724,494, Cl. 137-501.000.

Albert, David J.: *See—*
Urban, Peter; and Albert, David J., 3,725,303.

Albert, Dorothy S.: *See—*
Albert, Harry Elmer, 3,725,363.

Albert, Harry Elmer; deceased (by Albert, Dorothy S.; executrix), to Pennwalt Corporation. Method of curing elastomers with thiocarbamyl thiomethyl sulfides. 3,725,363, Cl. 260-79.50b.

Alberti, John; and Nanninga, William W., to Boeing Company, The. Conveying caster means. 3,724,022, Cl. 16-45.000.

Albertini, Eugene J.; and Shu, Stephen K., to Computer Management Systems, Inc. Automatic timekeeping and accounting unit. 3,725,947, Cl. 346-33.00r.

Albertson, Robert V. Safety device for all terrain vehicle. 3,724,579, Cl. 180-5.00r.

Albinger, Walter; and Heitzer, Karl, to U.S. Philips Corporation. Method of bonding a leader to magnetic tape. 3,725,164, Cl. 156-73.000.

Albiswerk Zurich AG: *See—*
Kupfer, Hanspeter; and Hossmann, Marcel, 3,725,920.

Alcan Research and Development Limited: *See—*
Baker, William Albert; Barker, Anthony Sydney Charles; Holden, John James Edmund; and Winterburn, Stanley Pilkington, 3,724,252.
Page, Clifford Frank, 3,724,247.
Wegner, Herman E., 3,724,251.

Aldo, Novara: *See—*
Pieri, Giovanni; Aldo, Novara; Held, Llewellyn John; and Bedetti, Gianfranco, 3,725,526.

Alexander, Ben H.: *See—*
Fischbein, Irwin W.; Alexander, Ben H.; and Sastri, Aiyaswami S., 3,725,238.

Alexander, Ronald Crawford. Signal detecting apparatus for use in sound track rerecording. 3,725,604, Cl. 179-100.1vc.

Allard, Pierre; Laparre, Jacques; and Lemaitre, Claude, to Societe Nationale Industrielle Aerospatiale. Device for securing a solid propellant grain in a combustion chamber. 3,724,219, Cl. 60-255.000.

Alleaume, Jean H., to Technigaz. Support for a self-carrying storage or conveying tank. 3,724,411, Cl. 114-74.00t.

Allegheny Ludlum Industries, Inc.: *See—*

Ramachandran, Sundaresan, 3,725,041.
Randich, Erasmus A., 3,724,302.

Allen Electric and Equipment Company, mesne: *See*—
Ukmar, Milosh L., 3,725,942.

Allen, Paul T.; Drinkard, B. M.; and Unger, Edward H., to Mobil Oil Corporation. Staged separations of aromatic mixtures with zeolites. 3,724,170, Cl. 55-67.000.

Allen, Ralph W.; and Marsh, Richard F., to Anaconda Aluminum Company. Bimetallic laminate and method of making same. 3,725,169, Cl. 156-184.000.

Allen, Richard W.; Maring, Donald G., Sr.; and Andrews, Henry J., Jr., to Rochester Telephone Corporation, The. Apparatus for protecting and testing telephone networks. 3,725,613, Cl. 179-175.300.

Allied Chemical Corporation: *See*—
Fuhrmann, Robert; and Van Peppen, Jan F., 3,725,489.
Li, Hsin Lang; Prevorsek, Dusan Ciril; and Rothmayer, Noel York, 3,724,039.
Poncha, Rustom Pestonji; Garofano, Norman Rutledge; and Gancy, Alan Brian, 3,725,014.
Rumanowski, Edmund J., 3,725,452.

Allied Trading Co.: *See*—
Faltico, Frank J., 3,725,892.

Allis-Chalmers Corporation: *See*—
Carroll, John T., 3,725,746.
Diamond, Harold G.; and Gustine, Floyd L., 3,724,755.
Gilmore, Thomas P., 3,725,771.

Allis-Chalmers Manufacturing Company: *See*—
Diamond, Harold G.; and Gustine, Floyd L., 3,724,416.
Lesiecki, Gerald, 3,724,861.
Wesolski, Henry J., 3,725,219.

Allison, William D., to Ford Motor Company. Torsion spring attachment construction. 3,724,869, Cl. 280-124.00b.

Alpers, Frederick C.: *See*—
Nolan, William J., Jr.; and Alpers, Frederick C., 3,724,783.

Alpers, Frederick C., to United States of America, Navy. Leading edge discriminator circuit. 3,725,935, Cl. 343-114.500.

Alpert, Seymour B.; Wolk, Ronald H.; Chervenak, Michael C.; and Nongbri, Govanon, to Hydrocarbon Research, Inc. Two-stage hydrodesulfurization of a high metal content hydrocarbon feed. 3,725,251, Cl. 208-210.000.

Alt, Anton, to Fischer, Georg, Aktiengesellschaft. Apparatus for the introduction of volatile additives into a melt. 3,724,829, Cl. 266-34.00t.

Alton, Ahdor H.; and Kohn, Mitchell I., to Gulton Industries, Inc. Combined bridge output and chopper circuit. 3,725,783, Cl. 324-101.000.

Altscher, Siegfried: *See*—
Kraft, Paul; and Altscher, Siegfried, 3,725,509.

Aluminum Company of America: *See*—
George, Daniel J.; and Patterson, William C., 3,724,711.
Parkhill, Vernon E.; and Bruno, Marshall J., 3,724,447.
Russell, Allen S.; Knapp, Lester L.; and Haupin, Warren E., 3,725,222.

Alworth, Harry M.; and Kalin, Sumner H., to United States Steel Corporation. Aging resistant cold rolled sheet products. 3,725,143, Cl. 148-36.000.

Amano, Yoshinao: *See*—
Yamaguchi, Terumoto; and Amano, Yoshinao, 3,724,538.

AMBAC Industries, Incorporated: *See*—
Voss, James R.; and Ferry, William R., 3,724,433.

Ambrose, Jere B., to Northern Fibre Products Company. Seat bun pull strips. 3,724,009, Cl. 5-360.000.

American Air Filter Company, Inc.: *See*—
Mutchler, Paul A., 3,724,995.
Tate, John E., 3,724,671.

American Bank Note Company: *See*—
D'Amato, Salvatore F.; Guertin, Clifford D.; and Lednicer, Oliver, 3,725,694.

American Broculture, Inc., mesne: *See*—
Smith, Jack D., 3,725,233.

American Cyanamid Company: *See*—
Berkelhammer, Gerald; and Asato, Goro, 3,725,396.
Brown, James Marvin, 3,725,440.
De Marco, John Gregory, 3,725,464.
Gerhardt, Gerard Ernest, 3,725,292.
Nozik, Arthur Jack; Tribit, Samuel; and Williams, Ferd E., 3,725,099.
Panzer, Hans Peter; and Rabinowitz, Robert, 3,725,312.
Tomcufcik, Andrew Stephen; Izzo, Patrick Thomas; and Fabio, Paul Frank, 3,725,407.

American Gage & Manufacturing Co., The, mesne: *See*—
Cain, Robert L.; and Rothrock, James S., 3,724,816.

American Home Products Corporation: *See*—
Gomez, Eloy A.; Goodsir, Stephen W.; and Marrocco, Dominic A., 3,724,460.
Lapidus, Milton; and McGettigan, Marian M., 3,725,453.
McCaully, Ronald J.; Bell, Stanley C.; and Conklin, George L., 3,725,389.
Potoski, John R.; and Freed, Meier E., 3,725,410.
Santilli, Arthur A.; and Kim, Dong H., 3,725,405.

American Hospital Supply Corporation: *See*—
Raible, Donald A.; and Pierie, Will R., 3,723,996.

American La France, Inc., mesne: *See*—
Smith, Edson W., 3,724,598.

American Optical Corporation: *See*—
Bole, Hamilton B., 3,724,260.

American Telephone and Telegraph Company: *See*—
Hutton, Gerald E., 3,725,600.

American Tobacco Company Limited, mesne: *See*—
Metzinger, Adrien Louis; and Raillard, Charles, 3,724,339.

Ames, Irving; D'Heurle, Francois M.; and Horstmann, Richard E., to International Business Machines Corporation. Copper doped aluminum conductive stripes. 3,725,309, Cl. 252-512.000.

Ames Rubber Corporation: *See*—
Nelson, William B., 3,724,983.

Ametek, Inc.: *See*—
Harland, Philip W., 3,724,278.

Amiard, Yves; and Bellissent, Jean-Paul, to Societe Nationale des Petroles d'Aquitaine. Cycloalkenyl tricycloalkene copolymers and production thereof. 3,725,366, Cl. 260-80.780.

AMP Domestic Inc., mesne: *See*—
Pountney, Clifford Harold; and Miller, Edward Francis, 3,725,131.
Schor, Ferdinand William; and Roup, Rolland R., 3,724,834.

AMP Incorporated: *See*—
Fernald, Charles Henry; and Chick, Joseph James, 3,724,054.
Hudson, William Jeffery, Jr., 3,725,825.

Ampco-Pittsburgh Corporation: *See*—
Ingerson, Quentin F., 3,725,056.

Ampex Corporation: *See*—
Fanella, Robert J.; Marcinkus, Donald W.; and Sterly, Glenn E., 3,724,779.

Anaconda Aluminum Company: *See*—
Allen, Ralph W.; and Marsh, Richard F., 3,725,169.

Anaconda American Brass Company: *See*—
Jones, Ronald B. L., 3,725,138.

Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Stand for a writing point, especially for tubular pens. 3,724,676, Cl. 211-69.700.

Andersen, Kjeld Jorn: *See*—
Wrisberg, Johannes; Andersen, Kjeld Jorn; and Mogensen, Erik, 3,725,495.

Andersen, Todd G., to Wescom, Inc. Discrete and integrated-type circuit. 3,725,683, Cl. 307-305.000.

Anderson, Albert E.; and Lum, Kin Kwong, to Eastman Kodak Company. Color diffusion processes utilizing hydroquinones which provide dye image materials upon oxidation in alkaline conditions. 3,725,062, Cl. 96-3.000.

Anderson, Albin R.; Jennings, John D.; and Killerby, Walter E., to Western Electric Company, Incorporated. Apparatus for frequency adjusting and assembling monolithic crystal filters. 3,724,739, Cl. 228-3.000.

Anderson, Carl C.: *See*—
Christenson, Roger M.; and Anderson, Carl C., 3,725,115.

Anderson, Norman C., to Varian Associates. Mounting ring and method for referencing members in a short arc lamp. 3,725,714, Cl. 313-110.000.

Anderson, Robert M.; Hanson, James M.; Lecrone, Richard C.; and Landgraf, William B., to General Electric Company. Linear photoflash lamp array and reflector unit therefor. 3,725,693, Cl. 240-1.300.

Anderson, Steven A.; Barker, Eugene C.; and Yang, Tung Han, to Pullman Incorporated. Hydraulic cushioning unit with boot type accumulator. 3,724,681, Cl. 213-43.000.

Anderson, William R. Heat shield. 3,724,024, Cl. 16-116.000.

Anderson, William R. Window shade bracket extension. 3,724,794, Cl. 248-268.000.

Andersson, Johan B.; and Lindbergh, Karl E. E., to Aktiebolaget Tudor. Method of making tubular battery electrode. 3,725,130, Cl. 136-63.000.

Andersson, Rune Siqvard. Valved pipe line connection. 3,724,810, Cl. 251-145.000.

Ando, Satoshi; Matsui, Masao; and Ogata, Fumimaro, to Kanegafuchi Boseki Kabushiki Kaisha and Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Composite filaments and spinneret and method for producing same. 3,725,192, Cl. 161-175.000.

Ando, Tadanao; Kataoka, Seiichi; and Shiihara, Isao, to Industrial Science & Technology, Agency of. Linear polyamides having high glass transition temperature prepared 4-(3-amino-propoxy)-phenyl-3-propylamine. 3,725,347, Cl. 200-47.0cz.

Andreas, Holger: *See*—
Weisfeld, Lewis B.; Andreas, Holger; and Muller, Horst, 3,725,338.

Andres, Rudolf; Stolz, Albert; and Moller, Hermann, to Daimler-Benz Aktiengesellschaft. Control device for controlling heating and air-conditioning installations in motor vehicles. 3,724,752, Cl. 236-86.000.

Andresen, Rolf, to International Business Machines Corporation. Method and apparatus for amplitude sensing and data gating in a magnetic-storage device with digital interface. 3,725,885, Cl. 340-174.10h.

Andrews, Henry J., Jr.: *See*—
Allen, Richard W.; Maring, Donald G., Sr.; and Andrews, Henry J., Jr., 3,725,613.

Andros Incorporated: *See*—
Link, William T., 3,725,701.

Angelucci, Joseph L.: *See*—
Angelucci, Thomas L.; Angelucci, Joseph L.; and Vilenski, Dan, 3,725,631.

Angelucci, Thomas L.; Angelucci, Joseph L.; and Vilenski, Dan, to Kulicke and Soffa Industries, Inc. Electro-mechanical servo drive. 3,725,631, Cl. 219-69.00g.
Angold, Edward Barnabas, to International Computers Limited. Magnetic recording apparatus with edge erase members which erase area between tracks. 3,725,607, Cl. 179-100.20d.
Anker-Werke Aktiengesellschaft: *See—*
Hecker, Alfred, 3,724,750.
Anstalt Europaische Handelsgesellschaft: *See—*
Sturzinger, Oskar Edwin, 3,725,579.
Antal, John. Ejection tool. 3,724,056, Cl. 29-253.000.
Antennacraft Company: *See—*
Lockwood, Lynn L., 3,725,945.
Anthony's Manufacturing Company, Inc.: *See—*
Stromquist, Michael E., 3,724,129.
Aoki, Masaki: *See—*
Wada, Mitsuo; Nishimoto, Kazuyuki; Aoki, Masaki; and Iida, Yoshio, 3,725,836.
Aono, Shigeo: *See—*
Nambu, Shyuya; and Aono, Shigeo, 3,724,822.
Appel, David W.; and Hong, Sung Ho, to Kimberly-Clark Corporation. Rotary drying drum. 3,724,094, Cl. 34-124.000.
Arai, Hiroshi; and Ohta, Jun. Vehicle skid control device. 3,725,858, Cl. 340-53.000.
Arai, Sakae, to Tokyo Shibauri Electric Co., Ltd. Microwave heater. 3,725,627, Cl. 219-10.550.
Arakawa, Takaai; Saeki, Kenji; Sato, Yoshikuni; and Kitazawa, Yoriya. Process for the oligomerization of ethylene. 3,725,497, Cl. 260-683.15d.
Araki, Kenji: *See—*
Kubotera, Haruo; Nakaoka, Kazuhide; Araki, Kenji; and Kurihara, Takao, 3,724,826.
Araki, Shinichi: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,724,726.
Arbeitsstelle fur Molekularelektronik: *See—*
Roder, Manfred, 3,725,146.
Arceneaus, Tilton J.: *See—*
Chiasson, Randall J.; Bourg, Ronald G.; and Arceneaus, Tilton J., 3,724,555.
Archer, Edward D.: *See—*
Shimely, Jesse H.; and Archer, Edward D., 3,725,302.
Arctic Roof Deicing Corporation: *See—*
Solin, Edward P.; and Post, Russell, 3,725,638.
Ares, Manuel, to United States of America, Air Force. Frequency diversified radar system. 3,725,926, Cl. 343-17.500.
Arkansas Rock and Gravel Co.: *See—*
Holland, John H., 3,724,692.
Armbruster, Otto: *See—*
Fichter, Walter; Armbruster, Otto; and Assmus, Friedrich, 3,724,843.
Armour and Company: *See—*
Gernandt, Louis E., 3,724,026.
Armstrong, Donald E.: *See—*
Miller, Charles H.; Broadt, David R.; and Armstrong, Donald E., 3,725,692.
Armstrong, Donald E., to GTE Sylvania Incorporated. Reflector extension for lamp unit. 3,724,346, Cl. 95-11.001.
Armstrong, Eldon L., to Mobil Oil Corporation. Polyurea thickened grease. 3,725,279, Cl. 252-51.50a.
Armstrong, Luther W.; and Rollings, William A., to Monsanto Company. Process for making continuous filament heather yarn. 3,724,199, Cl. 57-157.00s.
Arpe, Hans-Jurgen: *See—*
Boldt, Manfred; Arpe, Hans-Jurgen; and Hornig, Lothar, 3,725,462.
Arretz, Emmanuel: *See—*
Donche, Alain; Thibault, Claude; Arretz, Emmanuel; and Pfister, Alain, 3,725,394.
Arrighetti, Sergio; Corradini, Giorgio; and Cesca, Sebastiano, to Snam Progetti S.p.A. Process for obtaining modified polyethylenes and cross-linked polyethylenes having high mechanical, chemical and electric characteristics, and polyethylene obtained therby. 3,725,372, Cl. 260-88.20d.
Arrowhead Industries, Inc.: *See—*
Buck, Fred H., Jr., 3,724,002.
Arthur, Frank Henry: *See—*
Adamson, Donald; and Arthur, Frank Henry, 3,724,890.
Arvidsson, Carl-Eric, to Lagaholm AB. Truck having a vertically displaceable carrying frame. 3,724,697, Cl. 214-515.000.
Arvonia-Buckingham Slate Company, Inc.: *See—*
Cabell, Robert G.; Yancey, Thomas A.; Linville, Roy Norman; and Harrington, Daniel J., 3,724,439.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kurokawa, Isao; Kzawa, Nobuyuki; and Orita, Shunji, 3,724,870.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Shono, Tetsuji, 3,724,344.
Asato, Goro: *See—*
Berkelhammer, Gerald; and Asato, Goro, 3,725,396.
Asbeck, Werner; and Wilkening, Hermann, to Klockner-Werke Aktiengesellschaft. Method of and device for the coiling of metal tape or strip. 3,724,249, Cl. 72-146.000.
Ashcroft, Robert: *See—*
Bowell, S. T.; Ashcroft, Robert; and Pekarek, G. E., 3,725,328.
Ashkin, Arthur; Ippen, Erich Peter; and Kompfner, Rudolf, to Bell Telephone Laboratories, Incorporated. Optical stimulated emission devices employing split optical guides. 3,725,810, Cl. 331-94.500.
Ashland Oil, Inc.: *See—*
Hartlage, James Albert; and Cronberg, Alvin Dale, 3,725,046.
Ashworth, John Vernon; and Smith, John Hugh, to IPC Services Limited. Colour facsimile transmission system. 3,725,569, Cl. 178-5.20a.
Asplund, Robert W., to GTE Sylvania Incorporated. Interpolating apparatus. 3,725,794, Cl. 328-129.000.
Assmus, Friedrich: *See—*
Fichter, Walter; Armbruster, Otto; and Assmus, Friedrich, 3,724,843.
Asturiana de Zinc, S.A.: *See—*
Sitges, F. J., 3,724,471.
Ateliers Heuze, Malevez et Simon Reunis Societe Anonyme: *See—*
Dryon, Jacques Max Charles, 3,724,045.
Atkins, Carl E., to Wagner Electric Corporation. Self-adjusting condition-responsive control circuit. 3,725,748, Cl. 317-146.000.
Atkins, Jimmy G.: *See—*
Atkins, Luther C.; Atkins, Jimmy G.; and Atkins, Vonniebelle, 3,724,121.
Atkins, Luther C.; Atkins, Jimmy G.; and Atkins, Vonniebelle. Bandalore. 3,724,121, Cl. 46-61.000.
Atkins, Vonniebelle: *See—*
Atkins, Luther C.; Atkins, Jimmy G.; and Atkins, Vonniebelle, 3,724,121.
Atlantic Richfield Company: *See—*
Yoo, Jin Sun, 3,725,306.
Yoo, Jin Sun, 3,725,373.
Atlas Copco Aktiebolag: *See—*
Stromnes, Axel, 3,724,559.
Atomic Power Development Associates, Inc.: *See—*
Kuwabara, Jun, 3,724,268.
Attane, Edward C., Jr.: *See—*
Hass, Robert H.; Mickelson, Grant A.; Baral, William J.; Reeg, Cloyd P.; Attane, Edward C., Jr.; and Jones, Darryl L., 3,725,243.
Atwater, Wayne G., to Triax Company, The. Hoisting mechanism for automatic warehousing system. 3,724,688, Cl. 214-16.40a.
Audi Nsu Union Aktiengesellschaft: *See—*
Lang, Willi; and Sprenger, Manfred, 3,724,358.
Augustin, Wilfried: *See—*
Popp, Franz; and Augustin, Wilfried, 3,725,334.
Ault, Cyrus Frank; and Spencer, Robert Graham, to Bell Telephone Laboratories, Incorporated. Shift register clock pulse distribution system. 3,725,790, Cl. 328-37.000.
Auriemma, Nicholas A., to Universal Oil Products Company. Dispenser with metering system. 3,724,715, Cl. 221-4.000.
Auscoteng Pty. Ltd.: *See—*
Foley, Norman Leslie, 3,725,206.
Austin, Peter William; Crabtree, Allen; Leng, John Lindley; Robert, Denis; Ridyard, Annesley; and Young, Elliott, to Imperial Chemical Industries Limited. 2-Hydroxy-pyrid-6-one azo dyestuffs containing a cellulose fiber reactive substituent. 3,725,383, Cl.260-146.00t.
Automatic Helium Balloon Systems Inc.: *See—*
Elson, Edward E.; McQuary, Kenneth L.; Karlin, George H.; and Lane, Bert, 3,724,516.
Avco Corporation: *See—*
Langan, Marion J., 3,725,804.
Avery Laboratories, Inc.: *See—*
Avery, Roger E.; and Wepsic, James G., 3,724,467.
Avery, Roger E.; and Wepsic, James G., to Avery Laboratories, Inc. Electrode implant for the neuro-stimulation of the spinal cord. 3,724,467, Cl. 128-418.000.
Awrey, Kenneth D., to Westcoat Transmission Company Limited. Pipeline sealing device. 3,724,273, Cl. 73-389.000.
Ayala, Carl: *See—*
Goldfarb, Adolph E.; and Ayala, Carl, 3,724,125.
Ayres, Richard H., to Bemis Company, Inc. Reel winder apparatus. 3,724,649, Cl. 198-224.000.
Azuma, Keiichi: *See—*
Nakano, Satoshi; Azuma, Keiichi; Oba, Seiichiro; Wakizaka, Samon; and Nakamura, Sunichi, 3,725,507.
Babcock & Wilcox Company, The: *See—*
Sprague, Theodore S., 3,724,532.
Bach, Lloyd Gene, to Bendix Corporation, The. Pressure limiter for hydraulic booster. 3,724,332, Cl. 91-391.00r.
Bader, Horst, to Eckardt, J. C., AG. Pneumatic amplifier. 3,724,476, Cl. 137-842.000.
Badger Meter, Inc.: *See—*
Schmick, Russell M.; and Jocyno, Henry, 3,725,648.
Badische Anilin- & Soda Fabrik Aktiengesellschaft: *See—*
Bolte, Herbert; Wittmer, Paul; and Heil, Eduard, 3,725,506.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Fabian, Wolfgang; Franz, Joachim; and Polster, Rudolf, 3,725,433.
Kunde, Joachim; Ramlow, Gerhard; Buechler, Guenter; Pohlemann, Heinz; and Hendus, Hans, 3,725,503.
Petersen, Harro; Fuchs, Friedrich; and Ruemens, Wilhelm, 3,725,272.
Raff, Paul; Reuther, Wolfgang; and Petersen, Harro, 3,725,544.
Reinhard, Hans; Mueller, Alfred; and Dotzauer, Bernhard, 3,725,122.
Schulze, Gerhard; and Heck, Wolfgang, 3,725,537.

Baglai, Vitaly Mikhailovich: *See*—
Latash, Jury Vadimovich; Medova, Boris Izrailevich; and Baglai, Vitaly Mikhailovich, 3,724,530.
Bahder, George; Garner, Oscar G.; and Eager, George S., Jr., to General Cable Corporation. Insulated electrical cables and method of making them. 3,725,230, Cl. 204-159.200.
Bailey, Joseph; Knott, Edward B.; and Marr, Peter A., to Eastman Kodak Company. Silver halide emulsion containing 1-H-pyrazolo [3,2-c]-s-triazole color couplers. 3,725,067, Cl. 96-56.500.
Bailey, Knight V., to Bendix Corporation, The. Automatic plotter utilizing a coordinate grid device. 3,725,760, Cl. 318-568.000.
Bailey Meter Company: *See*—
Friedline, Leslie E.; Stevenson, Thomas E.; and Weber, Lee A., 3,725,949.
Bailey, Ronald B., to General Electric Company. Starting circuitry for series/parallel compensated, current-fed inverter. 3,725,770, Cl. 321-45.00r.
Bailey, Ronald L., to Barber-Colman Company. Input switch for reversing the sense of an amplifier in a single loop heating-cooking system. 3,725,644, Cl. 219-494.000.
Bakala, Ronald L.: *See*—
Buchholz, Donald E.; Bakala, Ronald L.; Miller, Robert E.; and Pickering, Richard W., 3,725,912.
Baker, Noel John, to Witton-James Limited. Paster tabs. 3,724,033, Cl. 24-67.0ar.
Baker, William Albert; Barker, Anthony Sydney Charles; Holden, John James Edmund; and Winterburn, Stanley Pilkington, to Alcan Research and Development Limited. Flattening mill. 3,724,252, Cl. 72-241.000.
Balassa, Leslie L., to Balchem Corporation. Herbicidal compositions and methods of preparing them. 3,725,031, Cl. 71-105.000.
Balbatun, Jan; and Makarewicz, Antoni. Method of production of multisectional filament coils and control system of a coiling machine operating according to this method. 3,724,190, Cl. 57-18.000.
Balchem Corporation: *See*—
Balassa, Leslie L., 3,725,031.
Baldwin, D. H., Company: *See*—
Munch, Walter, Jr.; and Studer, Richard L., 3,725,562.
Baled hay loading machine: *See*—
Miskin, Richard B., 3,724,634.
Balir, Charles M.; and Huband, Frank L., to Texas Instruments, Incorporated. Burst error detection and correction system. 3,725,859, Cl. 340-146.1al.
Ball Brothers Research Corporation: *See*—
Reed, Charles J., 3,725,744.
Woolley, Richard P., 3,724,279.
Ballard, Clinton S.: *See*—
Seelbinder, David C.; and Ballard, Clinton S., 3,725,071.
Ballo, Frank. Container construction. 3,724,722, Cl. 222-105.000.
Balogh, Edward, Jr.; Bennett, James Russell; Keenan, William F.; Logan, William A.; and Murphy, John S., to Burroughs Corporation. Data processing system having status indicating and storage means. 3,725,872, Cl. 340-172.500.
Balsbaugh, Vernon L. Crawler type load transporting device. 3,724,864, Cl. 280-5.280.
Balukin, Richard F., to Westinghouse Air Brake Company. Apparatus for regulating brake control pressure. 3,724,912, Cl. 303-16.000.
Bancroft, William G.: *See*—
Turnock, Philip H.; Bancroft, William G.; and Lee, Max N. Y., 3,725,299.
Banin, Amos, to Yissum Research Development Company of the Hebrew University of Jerusalem. Quantitative ion exchange process for clay. 3,725,528, Cl. 423-112.000.
Baraconi, William V.: *See*—
Baraconi, William V.; and LaFranca, Peter J., 3,724,716.
Baraconi, William V.; and LaFranca, Peter J., to Baraconi, William V. Bag dispenser. 3,724,716, Cl. 221-47.000.
Baral, William J.: *See*—
Hass, Robert H.; Mickelson, Grant A.; Baral, William J.; Reeg, Cloyd P.; Attane, Edward C., Jr.; and Jones, Darryl L., 3,725,243.
Barber-Colman Company: *See*—
Bailey, Ronald L., 3,725,644.
Barbin, Robert Lloyd, to RCA Corporation. Magnetic beam adjusting arrangements. 3,725,831, Cl. 335-212.000.
Barbulesco, Daniel J.; and Briar, John R., to General Motors Corporation. Spring clutch. 3,724,622, Cl. 192-105.0ce.
Bardiau, Roger, to Societe S.E.C.O.R. Frontal multi-spindle lathes. 3,724,300, Cl. 82-3.000.
Bargain, Michel, to Rhone-Poulenc S.A. Composition comprising an epoxy resin, acid anhydride and a N,N'-bis-imide. 3,725,345, Cl. 260-47.0ec.
Barham, Harold N.; and Barham, Harold N., Jr. Method of chemical treatment of cereal grains to make them more responsive to various grain processes. 3,725,081, Cl. 99-2.00r.
Barham, Harold N., Jr.: *See*—
Barham, Harold N.; and Barham, Harold N., Jr., 3,725,081.
Barilli, Filippo: *See*—
Cavenaghi, Carlo; Di Fiore, Lucio; Barilli, Filippo; and Calcagno, Benedetto, 3,725,257.
Barilli, Filippo; Lugo, Luigi; Di Fiore, Lucio; and Reni, Cesare, to Societa Italiana Resine S.p.A. Process for separating aromatic hydrocarbons from mixtures containing them by liquid-liquid extraction and azeotropic distillation. 3,725,255, Cl. 208-331.00.
Barker, Anthony Sydney Charles: *See*—
Baker, William Albert; Barker, Anthony Sydney Charles; Holden, John James Edmund; and Winterburn, Stanley Pilkington, 3,724,252.
Barker, Eugene C.: *See*—
Anderson, Steven A.; Barker, Eugene C.; and Yang, Tung Han, 3,724,681.
Barker, James E., to Cities Service Company. Manufacture of basic cupric compounds. 3,725,535, Cl. 423-419.000.
Barkow, August G. Wooden shipping containers. 3,724,701, Cl. 217-65.000.
Barmer Barmag Maschinenfabrik Aktiengesellschaf: *See*—
Itter, Friedhelm, 3,724,492.
Barnes, Robert L.; and Grafstein, Daniel. High temperature bis(epoxyalkyl)carborane adhesives. 3,725,176, Cl. 156-330.000.
Barone, Bruno J.; and Brill, William F., to Petro-Tex Chemical Corporation. Production of cyclic acetals. 3,725,438, Cl. 260-340.900.
Barr, Floyd A. Sack cutting attachment for a material receiving hopper. 3,724,721, Cl. 222-83.500.
Barron, Rodger W.; Fellers, Paul J.; and Huggart, Richard L., to Citrus State of Florida, Department of. Process for the production of naturally occurring coloring material from citrus fruit and the product thereof. 3,725,083, Cl. 99-105.000.
Barrot, Jean-Pierre; Negrou, Jacques; and Pelte, Charles, to Commissariat a l'Energie Atomique. Time interval analyzer. 3,725,785, Cl. 324-188.000.
Bashaw, John Darrell: *See*—
Leonard, Richard Lloyd; and Bashaw, John Darrell, 3,724,672.
Basic Incorporated: *See*—
Jepsen, Tage L. B., 3,725,039.
Baskin, Ronald W.: *See*—
Bishop, Dwight; and Baskin, Ronald W., 3,724,189.
Bates, Homer J.: *See*—
Carstens, Marion R.; and Bates, Homer J., 3,724,691.
Bates, Homer J., to Georgia Tech Research Institute. Unloading device for a capsule-transport pipeline system. 3,724,690, Cl. 214-52.00c.
Batson-Cook Company: *See*—
Cook, Harold E.; and Lanier, Harold H., 3,725,911.
Battaglini, Domenic; Beach, Richard G.; and Raquith, Howard R., to Sybron Corporation. Force balance variable condition transmitter. 3,724,275, Cl. 73-407.00r.
Batter, John F., Jr., to Polaroid Corporation. Method and apparatus for editing motion picture film. 3,724,935, Cl. 352-38.000.
Bauer, Peter, to Rohm & Haas G.m.b.H. Method for making an insulating body. 3,725,315, Cl. 260-2.50b.
Bauer, Thomas F.: *See*—
Adkins, William B.; Bauer, Thomas F.; and Beane, James O., 3,725,333.
Baum, Lester A. H., to Mobil Oil Corporation. Process for producing electrode binder asphalt. 3,725,240, Cl. 208-7.000.
Baumann, Friedrich, to Osteo AG. Prosthetic hip enarthrosis. 3,723,995, Cl. 3-1.000.
Baumann, Hans D., to Masoneilan International, Inc. Valve with removable seating means. 3,724,813, Cl. 251-360.000.
Bausch & Lomb Incorporated, mesne: *See*—
Lamb, Reginald T., 3,725,950.
Baxter, Brent, to General Instrument Corporation. Heating and cooling device. 3,724,536, Cl. 165-27.000.
Baxter Laboratories, Inc.: *See*—
Johnson, Stanley R.; and Forel, Sheldon H., 3,725,004.
Bayer Aktiengesellschaft: *See*—
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, 3,725,549.
Erdmenger, Rudolf; Ullrich, Martin; Germerdonk, Rolf; Pedain, Josef; Quiring, Bernd; and Wingler, Frank, 3,725,340.
Naumann, Gunter; Schon, Nikolaus; Schnoring, Hildegard; and Pampus, Gottfried, 3,725,313.
Bayer, Herbert, to Wandel u. Goltermann. Automatic calibrating and measuring system. 3,725,784, Cl. 324-130.000.
Beach, John M.: *See*—
Beach, John M.; and Brown, Melvin A. (said Brown assor. to said), 3,724,608.
Beach, John M.; and Brown, Melvin A., said Brown assor. to said Beach, John M. Draft device. 3,724,608, Cl. 188-112.000.
Beach, Mary B.: *See*—
Grote, George A., 3,724,177.
Beach, Richard G.: *See*—
Battaglini, Domenic; Beach, Richard G.; and Raquith, Howard R., 3,724,275.
Beach, Willard C.: *See*—
Grote, George A., 3,724,177.
Beal, Philip F.; and Shephard, Kenneth P., to Upjohn Company, The. 20,21-Acetonides of pregnense, 16β-alkyl-17α, 20,21-trihydroxy pregnenes, and processes for the production thereof. 3,725,392, Cl. 260-239.55d.
Beal, Philip F., III; and Pike, John E., to Upjohn Company, The. Prostanoic acid derivatives. 3,725,454, Cl. 260-488.00r.
Bean, Kenneth E.; and Yeakley, Richard L., to Texas Instruments, Incorporated. High density integrated circuits. 3,725,160, Cl. 156-17.000.
Beane, James O.: *See*—
Adkins, William B.; Bauer, Thomas F.; and Beane, James O., 3,725,333.
Beatty, Bobby D.; Butts, Gary D.; Herold, Stanley J.; and La Grange, Donald E., to United States of America, Navy. Fuze having a pneumatic and inertia arming system. 3,724,385, Cl. 102-81.000.

Beaulieu, Alexandre J.; Fortin, Roger; Johnson, Derwyn C.; and Robinson, Alexander, to Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Transverse electrode excitation o a molecular gas laser. 3,725,735, Cl. 315-249.000.

Beausoleil, William F., to International Business Machines Corporation. Key punch feature. 3,724,749, Cl. 234-18.000.

Bechtel International Corporation: *See*—
Neville, Roy G., 3,725,346.

Bechtold, Charles Louis, to Colgate-Palmolive Company. Soap composition. 3,725,288, Cl. 252-91.000.

Beck, Karl Maurice, to Abbott Laboratories. Cyclohexylammonium N-cyclohexylsulfmate as resin catalysts. 3,725,323, Cl. 260-17.300.

Beck, Robert E., to Fellowes Manufacturing Company. Storage box for storing hanging file folders. 3,724,920, Cl. 312-184.000.

Beck, Walter: *See*—
Blackwood, John C.; Hook, Edwin O.; and Beck, Walter, 3,725,476.

Becke, Edward G., to United States of America, Navy. Plug in antenna, antenna base and test probe system. 3,725,849, Cl. 339-92.00r.

Becker, Gordon D. Locking device for extensible tubes. 3,724,885, Cl. 287-58.0ct.

Beckman Instruments, Inc.: *See*—
Jacobson, Kenneth E., 3,724,748.
Matsuyama, George; and Lindell, Grover F., 3,725,237.
Neary, Michael P., 3,724,956.
Penhasi, Harry A., 3,725,010.
Rohrbaugh, Donald G.; and Petersen, Everett J., Jr., 3,724,765.

Beckstrom, Daniel H., to Kimberly-Clark Corporation. Web strength and tensile tester and method. 3,724,266, Cl. 73-95.000.

Bedetti, Gianfranco: *See*—
Pieri, Giovanni; Aldo, Novara; Held, Llewellyn John; and Bedetti, Gianfranco, 3,725,526.

Beecham Group Limited: *See*—
Brown, David Maxwell; and Watts, Eric Alfred, 3,725,429.

Beelitz, Howard Raymond, to RCA Corporation. Voltage driver circuit. 3,725,801, Cl. 330-30.00d.

Beer, Carl C.; and Larson, Sherman L., to Sherman Car Wash Equipment Company. Car wash conveyor. 3,724,390, Cl. 104-172.00b.

Behrens, Gunter, to Stiegelmeyer, Joh., & Co., G.m.b.H. Adjustable bed. 3,724,004, Cl. 5-68.000.

Behringwerke Aktiengesellschaft: *See*—
Mayr, Anton; Wagener, Kurt; Adolf, Johann Ditrich; Pette, Heinrich; and Petzoldt, Klaus, 3,725,542.

Belk, Earl H. Recliner chair. 3,724,896, Cl. 297-369.000.

Bell & Howell Company: *See*—
Cox, Arthur, 3,724,927.
Lancor, Joseph H., Jr.; and Cooper, Dexter P., Jr., 3,724,343.
Nupnau, Irthur E., 3,724,775.

Bell, Alan, to Foster Wheeler John Brown Boilers Limited. Power plants. 3,724,212, Cl. 60-73.000.

Bell Canada: *See*—
Cartwright, Delmar G., 3,725,594.

Bell, Christy W.; and Titus, Charles H., to General Electric Company. Electro-thermal process for production of off shore oil through on shore walls. 3,724,543, Cl. 166-248.000.

Bell, Stanley C.: *See*—
McCaully, Ronald J.; Bell, Stanley C.; and Conklin, George L., 3,725,389.

Bell Telephone Laboratories, Incorporated: *See*—
Ashkin, Arthur; Ippen, Erich Peter; and Kompfner, Rudolf, 3,725,810.
Ault, Cyrus Frank; and Spencer, Robert Graham, 3,725,790.
Braun, Edwin Julius; Meise, Henry August, Jr.; and Taylor, George William, 3,725,598.
Brown, Earl Franklin; and Kaminski, William, 3,725,578.
Cubbison, Richard James, Jr., 3,725,799.
Darlington, Sidney, 3,725,806.
Freimanis, Laimons, 3,725,863.
Fulton, Theodore Alan, 3,725,819.
Heightley, John Donnell, 3,725,687.
Hoffman, Clifford James, 3,725,602.
Ilegems, Marc; and Panish, Morton B., 3,725,149.
Jetzt, John J.; and Sullivan, John Charles, 3,725,601.
Lee, Tien Pei, 3,724,926.
Maxon, Rodney Robert; and Meise, Henry August, Jr., 3,725,596.
Mikulyak, Robert Michael, 3,725,008.
Phillips, Earl Gordon, 3,725,793.
Slana, Matthew Francis, 3,725,614.
Streisand, Kenneth, 3,725,597.
Ulrich, Reinhard; and Weber, Heinz Paul, 3,725,809.

Bellissent, Jean-Paul: *See*—
Amiard, Yves; and Bellissent, Jean-Paul, 3,725,366.

Belyanov, Sergei Alexandrovich: *See*—
Vishnevsky, Konstantin Pavlovich; and Belyanov, Sergei Alexandrovich, 3,724,176.

Bemis Company, Inc.: *See*—
Ayres, Richard H., 3,724,649.

Bender, John R., to Bendix Corporation, The. Compression fastener. 3,724,614, Cl. 188-218.0xl.

Bendix Corporation, The: *See*—
Bach, Lloyd Gene, 3,724,332.
Bailey, Knight V., 3,725,760.
Bender, John R., 3,724,614.
Brown, Joseph W., 3,724,454.
Burnett, Richard T., 3,724,616.
Cutler, Hymie, 3,725,651.
Graham, James T.; and Hackstock, Fred W., 3,724,052.
Julow, Thomas M., 3,724,211.
Klimchak, Edward George; and Rosenbaum, Erik, 3,725,928.
Kosakowski, Henry R., 3,725,903.
MacDuff, Stanley Irving, 3,724,915.
Mc Keown, James E.; Gregoire, Stephen E.; and Michel, Donald E., 3,725,844.
McKeown, James E.; and Michel, Donald E., 3,725,853.
Miller, Donald L., 3,724,619.
Reddy, Junuthula N., 3,725,678.
Rossigno, Louis P., 3,724,910.
Sollami, Blase J.; Lundeen, Howard R.; and Gerth, Bruce F., 3,724,228.
Thakore, Kaushik H., 3,725,732.
Weidman, Joseph S.; Yee, Henry C.; Elliott, Jack G.; and Margosian, Zaven, 3,725,921.
Winge, John L., 3,724,611.

Bendler, Hellmut: *See*—
Gawlick, Heinz; Marondel, Gunther; Sieglein, Werner; Wasser, Wolfgang; and Bendler, Hellmut, 3,724,381.

Bengtson, Olle, to Imperial Chemical Industries Limited. Process for the manufacture of polyurethane foam by controlling the rate of heat generation. 3,725,318, Cl. 260-2.5bd.

Benjamin, Marshall E. Portable knock-down animal enclosure. 3,724,424, Cl. 119-16.000.

Bennett, Delora E.; and Packard, Roger A., to Delro Engineering Corporation. Method for reshaping a shoe last. 3,724,014, Cl. 12-146.001.

Bennett, Eugene E.; and Stansell, Alpheus F., to Burroughs Corporation. Modular disk file unit. 3,725,883, Cl. 340-174.10c.

Bennett, James Russell: *See*—
Balogh, Edward, Jr.; Bennett, James Russell; Keenan, William F.; Logan, William A.; and Murphy, John S., 3,725,872.

Benson, Carl I., Jr., to Paragon Gears Incorporates. Releasable power-transmitting device of the friction plate type. 3,724,620, Cl. 192-70.230.

Benson, Harvey S., Jr., to Envirco Corporation. Process for separating particles from aerosols. 3,724,181, Cl. 55-432.000.

Benson, Ronald W.: *See*—
Gallaghan, John A.; Benson, Ronald W.; and Carlson, Bertil V., 3,724,383.

Berding, Andrew R., to International Business Machines Corporation. Memory cell circuit. 3,725,878, Cl. 340-173.0ff.

Beregi, Laszlo; Hugon, Pierre; and Le Douarec, Jean-Claude, to Science-Union et Cie. Biphenylyl pyrozole compounds. 3,725,432, Cl. 260-310.00r.

Bereit, Arnold E. E. Device for the hydrostatic supporting of machine parts. 3,724,597, Cl. 184-5.000.

Berg, Allen Charles: *See*—
Murthy, Nanjundiah Narasimha; Macura, Joseph Steven; Gergely, William, Jr.; and Berg, Allen Charles, 3,724,366.

Bergey, John M., to HMW Industries, Inc. Nuclear-paced solid state wristwatch. 3,724,201, Cl. 58-50.00r.

Bergmann, Rolf: *See*—
Rogalski, Werner; Jonas, Rochus; Wahlig, Helmut; and Bergmann, Rolf, 3,725,390.

Bergwerksverband GmbH: *See*—
Walkenhorst, Wilhelm, 3,724,174.

Beriger, Ernst, to Ciba-Geigy AG. Phosphoric acid ester. 3,725,513, Cl. 260-951.000.

Berkelhammer, Gerald; and Asato, Goro, to American Cyanamid Company. 2,5-Disubstituted 1,3,4-thiadiazoles. 3,725,396, Cl. 260-240.00g.

Bermingham, Peter D., to Goodyear Tire & Rubber Company, The. Brake disc with beryllium core and carbon wear faces. 3,724,613, Cl. 188-218.0xc.

Berney, Joseph C. Packing station for foldable carton handling apparatus. 3,724,185, Cl. 53-186.000.

Bernheim, Willy; and Deiner, Hans, to Chemische Fabrik Pfersee GmbH. Water-soluble or inherently water-dispersible condensation products. 3,725,502, Cl. 260-830.0tw.

Berry, Currie B., Jr.; and Valdo, Alex R., to Ethyl Corporation. Foamed aluminum. 3,725,037, Cl. 75-20.00f.

Berry, Elton L.: *See*—
McClendon, Jack C.; and Berry, Elton L., 3,725,387.

Berta, Dominic A., to United States of America, Navy. Method of curing double base propellants. 3,725,157, Cl. 149-97.000.

Berthold, Rainer. Electro-optical determination of wear of paper making screen. 3,725,666, Cl. 250-219.0df.

Bertin & Cie: *See*—
Bertin, Jean Henri; and Francois, Paul, 3,724,588.

Bertin, Jean Henri; and Francois, Paul, to Bertin & Cie. Cushion confining system. 3,724,588, Cl. 180-118.000.

Bertness, Theodore A.: *See*—
Snavely, Earl S., Jr.; Bertness, Theodore A.; and Morris, Richard L., 3,724,553.

Bertva, John T.: *See*—
Dixon, Don P.; and Bertva, John T., 3,724,232.

Beryllium Corporation, The: *See*—
Velten, Edmund M.; Jagaciak, George J.; Wambold, John N.; and Epstein, Arthur, 3,724,050.

Bethhehem Steel Corporation: *See*—
Riedel, John Y., 3,725,050.

Bevan, Ronald, to Imperial Chemical Industries, Limited. Sheet handling. 3,724,685, Cl. 214-8.50r.

Beyl, Jean Joseph Alfred. Heel hold-down device for ski boot. 3,724,868, Cl. 280-11.35t.

Biedermann, Kurt: *See—*
Schenk, Erwin; and Biedermann, Kurt, 3,725,796.

Bier, Kenneth C., to Holley Carburetor Company. Remote metering system. 3,724,435, Cl. 123-139.00e.

Biffle, Morris S. Drill head and sealing apparatus therefore. 3,724,862, Cl. 277-31.000.

Bigelow, John Howard, to Du Pont de Nemours, E. I., and Company. Boranes as photographic stabilizers. 3,725,078, Cl. 96-109.000.

Biguenet, Charles, to CSF-Compagnie Generale de Telegraphie Sans Fil. Titanium filament for use in vacuum techniques. 3,724,049, Cl. 29-191.000.

Billot, Claude: *See—*
Retali, Roger; Mercier, Andre; and Billot, Claude, 3,724,238.

Bilow, Norman; and Rosenberg, Harold, to United States of America, Air Force. Process for curing polyferrocenylenes. 3,725,175, Cl. 156-327.000.

Bio-Optronics, Inc.: *See—*
Rose, Harold Bern; and Sand, Bruce Jay, 3,724,263.

Birkett, Samuel, Limited: *See—*
Thornton, Brian, 3,724,753.

Birkigt, Louis, to Brevets Aero-Mecaniques S.A. Shell cartridges. 3,724,377, Cl. 102-38.000.

Bishop, Dwight; and Baskin, Ronald W., to Southwire Company. Method and apparatus for stripping cable. 3,724,189, Cl. 57-2.500.

Bishop, Peter, to United Industrial Syndicate, Inc. Static neutralizer. 3,725,736, Cl. 317-2.00f.

Bitsura, Michael P.: *See—*
Brevko, Robert; Bitsura, Michael P.; Mucka, John R.; and Zinski, Peter, 3,724,164.

Black and Decker Manufacturing Company: *See—*
Leimbach, Wendell B.; Marshall, James W.; and Abbratozzato, Salvatore R., 3,725,707.

Black and Decker Manufacturing Company, The: *See—*
Wickham, John L.; Ramstrom, Lee W.; Wordsworth, Albert G.; and Meloni, Robert A., 3,724,563.
Wood, John W., 3,724,237.

Black, Stanley H.; and Formeister, Richard B., to Sperry Rand Corporation. Direction finder system. 3,725,938, Cl. 343-120.000.

Blackmore, Kenneth A. E., to Georgia-Pacific Corporation. Preparation of ammonium sulfate fertilizer consultituent. 3,725,029, Cl. 71-28.000.

Blacksmith, Philipp: *See—*
Sletten, Carlyle J.; Schell, Allan C.; Mack, Richard B.; Goggins, William B., Jr.; and Blacksmith, Philipp, 3,725,917.

Blackwood, John C.; Hook, Edwin O.; and Beck, Walter, to Stepan Chemical Company. Unsaturated amides of oxybis (benzenesulfonic acid). 3,725,476, Cl. 260-556.0ar.

Blahak, Johannes: *See—*
Wirth, Wolf-Dieter; Muller, Erwin; Blahak, Johannes; and Rohr, Harry, 3,725,321.

Blakeley, Ronald Edward; and Turner, Robert, to Lucas, Joseph, (Industries) Limited. Method of testing the lubrication properties of a liquid. 3,724,259, Cl. 73-10.000.

Blanchet, Lucien, to Air LB. Waterproof electrical connector. 3,725,852, Cl. 339-198.00j.

Blangis, Jacques: *See—*
Le Cheualier, Pierre; and Blangis, Jacques, 3,724,321.

Blecker, Joseph G. Mast for sailing vessels. 3,724,412, Cl. 114-90.000.

Bleiweiss, Mark H., to Raytheon Company. Visual display system. 3,725,897, Cl. 340-324.00a.

Blodgett, Stewart B. Method and apparatus for controlling product charge weights. 3,724,569, Cl. 117-1.000.

Bloom, Martin S., to Imperial Chemical Industries Limited. Foam laminates. 3,725,191, Cl. 161-160.000.

Bloom, Stanley M., to Polaroid Corporation. Sunglasses having novel plastic optical element for lenses. 3,724,934, Cl. 351-44.000.

Bodnar, Ernest Robert. Spreader for slit web materials. 3,724,737, Cl. 226-199.000.

Boehringer Ingelheim G.m.b.H.: *See—*
Grell, Wolfgang; Griss, Gerhart; and Kleemann, Manfred, 3,725,388.

Boehringer Mannheim GmbH: *See—*
Stoeck, Georg; Budka, Heinz-Gunter; Topfmeier, Fritz; and Gradel, Wolf-Dietrich, 3,725,465.

Boeing Company, The: *See—*
Alberti, John; and Nanninga, William W., 3,724,022.
Pogson, John T., 3,724,522.

Bogue, Joseph A. Closure assembly and emergency release locking mechanism therefor. 3,724,130, Cl. 49-141.000.

Bohm, Horst: *See—*
Paucksch, Heinrich; Massonne, Joachim; Bohm, Horst; and Fernschild, Gunter, 3,725,475.

Boissier, Jacques R.; and Ratouis, Roger, to Societe Anonyme dite: Societe Industrielle pour Li Fabrication des Antibiotiques (S.I.F.A.). 3-Tropanylidine derivatives of tricyclic compounds, their salts, and process of preparation. 3,725,415, Cl. 260-292.00.

Boivin, Joseph J. R.: *See—*
Zehavi, Samuel; Boivin, Joseph J. R.; Hamilton, Douglas D.; and Ranzenhofer, Raoul, 3,724,518.

Boldt, Manfred; Arpe, Hans-Jurgen; and Hornig, Lothar, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of substituted phenyl esters and optionally substituted phenols. 3,725,462, Cl. 260-479.00r.

Bole, Hamilton B., to American Optical Corporation. Lens frangibility testing apparatus. 3,724,260, Cl. 73-12.000.

Bolgert, Edwin F.: *See—*
Povalski, Eugene A.; and Bolgert, Edwin F., 3,724,480.

Bolliger, Andre, to Aktiengesellschaft Brown, Boveri & Cie. Semiconductor disc having tapered edge recess filled with insulation compound and upstanding cylindrical insulating ring embedded in compound to increase avalanche breakdown voltage. 3,725,750, C. 317-234.00r.

Bolte, Herbert; Wittmer, Paul; and Heil, Eduard, to Badische Anilin- & Soda Fabrik Aktiengesellschaft. Manufacture of copolymers of styrene and- methylstyrene. 3,725,506, Cl. 260-88.20c.

Boneck, Roger L. Window shade supports. 3,724,525, Cl. 160-28.000.

Bonjour, Emmanuel; and Couach, Michel, to Commissariat a l'Energie Atomique. Method for bringing a number of substances together by remote control and a device for carrying out said method. 3,724,820, Cl. 259-114.000.

Bonner, William A., to Rockford Servo Corporation. Web sensing and guiding apparatus. 3,724,732, Cl. 226-21.000.

Boose, Cesar Adrianus; Reidt, Maarten Johan; and Derksen, Evert Hermanus, to Reactor Centrum Nederland. Method for the blackening of aluminum alloys. 3,725,137, Cl. 148-6.200.

Borden, Inc.: *See—*
Adkins, William B.; Bauer, Thomas F.; and Beane, James O., 3,725,333.
Clark, Charles William, 3,724,655.

Borg-Warner Corporation: *See—*
Clauss, Julius A., Jr.; Conley, Jack S.; and Lemon, Robert W., 3,724,626.
Hallberg, Irving H., 3,724,205.
Padgitt, Kenneth W., 3,725,668.

Borg-Warner Corporation, mesne: *See—*
Dever, James L.; and Hodan, James J., 3,725,510.

Borgs Fabriks AB: *See—*
Fonden, Per Borje; and Walander, Kar Ove Torgny, 3,724,333.
Fonden, Per Borje; and Walander, Karl Ove T., 3,724,787.

Borinski, Adolfo Samuel Werner. Method for storing electric energy and an electric energy storing system. 3,725,705, Cl. 310-5.000.

Borman, August H., to General Motors Corporation. Transmission control. 3,724,292, Cl. 74-864.000.

Borrel, Marcel; Marion, Jacques; and Metzger, Jean, to Ugine Kuhlmann. Production of acetonitrile. 3,725,457, Cl. 260-465.100.

Borsuk, Pavel Afanasievich: *See—*
Lyass, Abram Moiseevich; Snulova, Lidia Dorofeevna; Borsuk, Pavel Afanasievich; Tsyruleva, Anna Ivanovna; and Teplyakov, Sergei Dmitrievich, 3,725,090.

Bosc, Henri J.; Castets, Michel G.M.; and Debuisser, Jean-Claude A., to International Standard Electric Corporation. Coherent digital pulse doppler radar system with improved signal handling capacity. 3,725,923, Cl. 343-7.700.

Bosch, Robert, G.m.b.H.: *See—*
Adler, Karl-Heinz, 3,724,430.
Ellwanger, Hans; Kraisel, August; Kraus, Walter; and Zirps, Wilhelm, 3,724,003.
Kobald, Walter, 3,724,609.
Schneider, Karl-Heinz; Herker, Dietrich; Madgefrau, Herbert; Plockl, Alfons; and Horrwarth, Ernst, 3,725,620.

Boschung, Marcel; and Gisler, Hans, to Boschung, Marcel, Firma. Apparatus adapted to be coupled to a traction vehicle serving for the maintenance or construction of water-bound roads. 3,724,557, Cl. 172-197.000.

Boschung, Marcel, Firma: *See—*
Boschung, Marcel; and Gisler, Hans, 3,724,557.

Bose, Elaine A.; and White, Earl R., to University of California, The Regents of the. Benzimidazole derivatives as fungicidal active compounds. 3,725,406, Cl. 260-249.500.

Bosland, James M., to Ketcham & McDougall, Inc. Shredder. 3,724,766, Cl. 241-100.000.

Bosshard, Walter: *See—*
Purt, Gustav A.; and Bosshard, Walter, 3,725,011.

Bostick, Frank W., to Schick Electric Inc. Pad finger grip for electric shaver case. 3,725,190, Cl. 161-159.000.

Botsford, Samuel. Paper clip. 3,724,036, Cl. 24-261.0pc.

Bott, Lawrence L., to Nalco Chemical Company. Inverted latex water flooding method. 3,724,547, Cl. 166-274.000.

Boudry, Jean Marie: *See—*
Moreau, Jean Pierre; and Boudry, Jean Marie, 3,725,791.

Boulanger, Henry J., to Texas Instruments, Incorporated. Pushbutton keyboard system. 3,725,907, Cl. 340-365.00a.

Boulton, William, Limited: *See—*
Fahey, Denis; and Clarke, Reginald L., 3,724,146.

Bourez, Henri: *See—*
Brocart, Rene; and Bourez, Henri, 3,724,051.

Bourg, Ronald G.: *See—*
Chiasson, Randall J.; Bourg, Ronald G.; and Arceneaus, Tilton J., 3,724,555.

Bourgoin, Gerard; Kumurdjian, Pierre; Loitiere, Alain; and Pere, Jean-Francois, to Commissariat a l'Energie Atomique. System for adjusting the value of a resistance to a predetermined value. 3,725,685, Cl. 235-151.100.

Bourne, James G.: *See—*
Roblin, John M.; Cole, Frank J.; and Bourne, James G., 3,725,045.

Boustany, Kamel; and Coran, Aubert Y. Inhibiting premature vulcanization of rubber with N-thio hydrazodicarboxylate. 3,725,361, Cl. 260-79.50b.

Bowden, Roy Dennis; and Seaton, Thomas, to Imperial Chemical Industries, Limited. Manufacture of halogenated pyridine derivatives. 3,725,414, Cl. 260-290.0hl.

Bowell, S. T.; Ashcroft, Robert; and Pekarek, G. E., to SCM Corporation. Latex coating composition having yield valves of 95-550 dynes/cm$_2$ and shear stress of at least 90 dynes/cm$_2$ at shear rate of about 0.1-0.2/sec. 3,725,328, Cl. 260-29.60r.

Bowen, Braxton C., to Du Pont de Nemours, E. I., and Company. Process for extracting and drawing a tow. 3,725,523, Cl. 264-210.00f.

Bowers, William S., to United States of America, Agriculture. Insect control process with synthetic hormones. 3,725,551, Cl. 424-282.000.

Box, Theodor M. Plastic carrying case for use with skatewheel conveyers. 3,724,628, Cl. 193-35.00r.

Boyd, Donald R. Apparatus for landing pipe. 3,724,683, Cl. 214-2.500.

Boyko, Eugene S.: *See—*
Fink, Robert W.; and Boyko, Eugene S., 3,725,635.

Boyles, Robert L.; and Polonsky, Samuel, to General Electric Company. Pawl and ratchet mechanism for alarm clock time sleep switch cam. 3,725,615, Cl. 200-38.0fb.

Boyles, Robert L.; and Polonsky, Samuel, to General Electric Company. Alarm clock timer with switch actuating lever operable by cam or manual adjustment mechanism. 3,725,617, Cl. 200-38.0fb.

BP Chemicals Limited: *See—*
Sturt, Alan Charles, 3,725,375.

Bradwell, Cyril; and Pope, Robert C. Sealbar for continuous grate sintering machines. 3,724,828, Cl. 266-21.000.

Brand, Oskar, to Daimler Benz Aktiengesellschaft. Mechanism for adjusting the height of seats especially of motor vehicles. 3,724,895, Cl. 297-348.000.

Brandstrom, Arne Elof; Gustavii, Klas Ragnar; Junggren, Ulf Krister; and Kylberg, Kerstin, to Aktiebolaget Hassle. Method of quantitative determination of anions. 3,725,006, Cl. 23-230.00r.

Brandt, William L., to Olin Corporation. Target launcher. 3,724,438, Cl. 124-11.00r.

Bratkowski, Walter V.; and Pittman, Paul F., to Westinghouse Electric Corporation. Direct current amplifier. 3,725,807, Cl. 330-185.000.

Braun Aktiengesellschaft: *See—*
Messinger, Werner, 3,724,072.

Braun, Arthur R. Spray device. 3,724,763, Cl. 239-490.000.

Braun, Edwin Julius; Meise, Henry August, Jr.; and Taylor, George William, to Bell Telephone Laboratories, Incorporated. Digital register readout circuit. 3,725,598, Cl. 179-18.0eb.

Brechbuhler, Hans Ulrich; and Gubler, Kurt, to Geigy Chemical Corporation. 1-Piperidino-1-cyano-O-carbamoyl-formoxides. 3,725,418, Cl. 260-293.860.

Bregenzer, O., & Co.: *See—*
Bregenzer, Otto, 3,724,148.

Bregenzer, Otto, to Bregenzer, O., & Co. Cable receiving floor conduit. 3,724,148, Cl. 52-221.000.

Breitfuss, Thomas K.; Wallace, Floyd L.; and Zicaro, Joseph P., to Hydro Conduit Corporation. Method of making wrapped tubular concrete. 3,724,768, Cl. 242-7.020.

Brennan, Francis P. Expendable pallet device. 3,724,398, Cl. 108-51.000.

Brennan, James A., to Mobil Oil Corporation. Recyclable liquid aluminum chloride and bromide complexes. 3,725,498, Cl. 260-683.15b.

Brennan, Lawrence E.; and Reed, Irving S., to Technology Service Corporation. Convergence rate improvement for adaptive receiving array antennas of higher order than 2-pulse MTI cancellers. 3,725,922, Cl. 343-7.00a.

Breslow, Donald H.; and Wingate, Sidney A., to Itek Corporation. Encoder with a redundant optical system. 3,725,904, Cl. 340-347.00p.

Breslow, Jeffrey D.: *See—*
Glass, Marvin I.; and Breslow, Jeffrey D., 3,724,848.

Bretschneider, Hermann; Kaiser, Ado; and Hohenlohe-Oehringen, Kraft, to Hoffmann-La Roche Inc. Amino acid derivatives. 3,725,470, Cl. 260-519.000.

Brevets Aero-Mecaniques S.A.: *See—*
Birkigt, Louis, 3,724,377.

Brevko, Robert; Bitsura, Michael P.; Mucka, John R.; and Zinski, Peter, to Ruburn Engineering, Inc. Shrink-wrapping apparatus. 3,724,164, Cl. 53-229.000.

Brewer, John C., to Garbalizer Corporation of America. Production of carbon from waste materials. 3,725,538, Cl. 423-449.000.

Briar, John R.: *See—*
Barbulesco, Daniel J.; and Briar, John R., 3,724,622.

Brickley, Terence, to Rubery, Owen & Co., Limited. Suspension means for load handling equipment. 3,724,891, Cl. 294-67.00r.

Bride, John Edwin, to Du Pont de Nemours, E. I., and Company, mesne. Chromium plating medium for a portable plating device. 3,725,214, Cl. 204-15.000.

Bridenbaugh, Edwin R.: *See—*
Moniak, John; and Bridenbaugh, Edwin R., 3,725,585.

Bridestone Liquefied Gas Company, Limited: *See—*
Yamamoto, Katsuro, 3,724,703.

Brill, William F.: *See—*
Barone, Bruno J.; and Brill, William F., 3,725,438.

Brisebarre, Marcel; and de Saint Sauveur, Xavier, to Control Data Corporation. Impact transducer keyboard apparatus. 3,725,908, Cl. 340-365.00a.

British Iron and Steel Research Association, The: *See—*
Reed, Geoffrey Ronald, 3,724,159.

British Steel Corporation: *See—*
Smith, Joseph Cyril, 3,724,035.

Broadt, David R.: *See—*
Miller, Charles H.; Broadt, David R.; and Armstrong, Donald E., 3,725,692.

Brocart, Rene; and Bourez, Henri, to Manufacture d'Accumulateurs et d'Objets Moules and Societe Fulmen. Distributors components. 3,724,051, Cl. 29-204.000.

Brock-White Co.: *See—*
Sels, Wally O.; and Paul, Alfred L., 3,724,801.

Brockmuller, Friedrich Franz, to Windmoller & Holscher. Process for manufacturing bags comprising a liner bag which protrudes from the opening. 3,724,340, Cl. 93-35.00r.

Brockway, Richard J.: *See—*
Hayner, Paul F.; and Brockway, Richard J., 3,724,502.

Brookhyser, Byron B.; Erickson, Harold E.; and Perry, Glenn R., to Weyerhaeuser Company. Automatic plywood layup machine. 3,725,183, Cl. 156-563.000.

Brooks, Howard A.; and Burzan, Vernon J., to Leisure-Tron Corporation. Light responsive and directing extraterrestrial vehicles. 3,724,854, Cl. 273-101.100.

Brooks, Kenneth, to Celanese Corporation. Yarn take-up. 3,724,769, Cl. 242-18.0dd.

Brown & Root, Inc.: *See—*
Jones, Jerry J.; and Lochridge, Joe C., 3,725,919.

Brown, David; and Saffer, Alfred, to Halcon International, Inc. Process for preparing a silver-supported catalyst. 3,725,307, Cl. 252-455.00r.

Brown, David Maxwell; and Watts, Eric Alfred, to Beecham Group Limited. Benzamidoimidazolines. 3,725,429, Cl. 260-309.600.

Brown, Deane David, to Itek Corporation. Electrical connector. 3,725,829, Cl. 333-84.00m.

Brown, Earl Franklin; and Kaminski, William, to Bell Telephone Laboratories, Incorporated. Digital video receivers. 3,725,578, Cl. 178-7.50r.

Brown, Harold J., to Lorain Products Corporation. Frequency compensating circuit for voltage regulators. 3,725,766, Cl. 321-5.000.

Brown, James D.: *See—*
Mueller, Francis X., Jr.; and Brown, James D., 3,725,301.

Brown, James Marvin, to American Cyanamid Company. Softening agent for cotton and for synthetic textile substrates. 3,725,440, Cl. 260-400.000.

Brown, Joseph K. Combination of bar stool and refuse container. 3,724,745, Cl. 232-43.200.

Brown, Joseph W., to Bendix Corporation, The. Humidifier-nebulizer. 3,724,454, Cl. 128-194.000.

Brown, Melvin A.: *See—*
Beach, John M.; and Brown, Melvin A., 3,724,608.

Brown, Omar L.; and Smyth, George F., to Fraze, Ermal C., mesne. Method of making riveted joint. 3,724,063, Cl. 29-509.000.

Brown, Verle H. Hydrothermal liquefied petroleum gas vaporization system. 3,724,426, Cl. 122-33.000.

Brownbuilt Limited: *See—*
Greaves, Richard Johnson, 3,724,389.

Brownell, Roy D.; and Rogers, Richard E., to Clark Equipment Company, mesne. Indicator or control for cranes. 3,724,679, Cl. 212-39.0ms.

Browning, Vernon D.: *See—*
Kleykamp, Donald L.; Gaster, Ivan; Browning, Vernon D.; and Holden, Homer N., 3,724,507.
Kleykamp, Donald L.; Gaster, Ivan; Browning, Vernon D.; and Holden, Homer N., 3,725,178.

Bruck, Herbert: *See—*
Busch, Josef; Bruck, Herbert; Schranz, Karl-Wilhelm; Schon, Erwin; and Frick, Hans-Dieter, 3,724,355.

Bruker Physik AG: *See—*
Ratzel, Dieter, 3,725,772.

Bruno, Marshall J.: *See—*
Parkhill, Vernon E.; and Bruno, Marshall J., 3,724,447.

Brunson, Glenn S.; Curran, Robert N.; and Just, Franklin H., to United States of America, Atomic Energy Commission. Digital subtraction device. 3,725,688, Cl. 235-176.000.

Bryant, Ozro, to Westinghouse Electric Corporation. Extraction control system for a turbogenerator set. 3,724,214, Cl. 60-73.000.

Bschorer, Konrad, to Friedrich Deckel Aktiengesellschaft. Gear motor or pump. 3,724,975, Cl. 418-10.000.

Buchanan, Robert A.; Tecotzky, Melvin; and Wickersheim, Kenneth A., to Lockheed Aircraft Corporation. Rare earth phosphors for X-ray conversion screens. 3,725,704, Cl. 250-71.00r.

Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, to Bayer Aktiengesellschaft. N-trityl-imidazoles for controlling plant fungi. 3,725,549, Cl. 424-273.000.

Buchholz, Donald E.; Bakala, Ronald L.; Miller, Robert E.; and Pickering, Richard W., to United States of America, Navy. Radar video recording system. 3,725,912, Cl. 343-5.0pc.

Buchstaller, Anton, to Dornier AG. Arrangement of jet lift engines in aircraft. 3,724,785, Cl. 244-55.000.

Buck, Fred H., Jr., to Arrowhead Industries, Inc. Perfume or deodorizer dispenser. 3,724,002, Cl. 4-222.000.

Buck, Leo V.: *See—*

Laue, Terry J.; and Buck, Leo V., 3,724,095.
Bucko, Edward P. Hand held pop tab opener. 3,724,297, Cl. 81-3.46a.
Bucky, Peter A. X-ray film cassette. 3,725,703, Cl. 250-65.00r.
Budd Company, The: *See*—
Wessells, Henry W., III; and Eggert, Walter S., Jr., 3,724,153.
Budka, Heinz-Gunter: *See*—
Stoeck, Georg; Budka, Heinz-Gunter; Topfmeier, Fritz; and Gradel, Wolf-Dietrich, 3,725,465.
Buechler, Guenter: *See*—
Kunde, Joachim; Ramlow, Gerhard; Buechler, Guenter; Pohlemann, Heinz; and Hendus, Hans, 3,725,503.
Buhk, Randall P.: *See*—
Faiks, Frederick S.; and Buhk, Randall P., 3,724,897.
Buhrer, Erwin, to Fischer, Georg, Aktiengesellschaft. Transport system for castings including a swingable, perforated transport bucket. 3,724,659, Cl. 209-238.000.
Bullis, Douglas E.; and Linde, John P., to Remington Arms Company, Inc. Firing pin mechanism for firearms. 3,724,112, Cl. 42-41.000.
Bullivant, Kenneth W., to K-Tron Corporation. Digital mass flow control system. 3,724,720, Cl. 222-55.000.
Bunker, Loomis O. Organic disposal machine. 3,724,187, Cl. 56-361.000.
Burbine, William G.: *See*—
Jordan, Merrill E.; Burbine, William G.; and Williams, Frank R., 3,725,103.
Burgess, Douglas P.; and Harkey, Johnny D., to Cannon Mills Company. Temple for terry looms and method of operating same. 3,724,509, Cl. 139-25.000.
Burgess, Ronald R., to F & E Manufacturing Company. Pressure-vacuum relief fuel filler cap. 3,724,707, Cl. 220-44.00r.
Burgess, Ronald R., to F & E Manufacturing Company. Pressure-vacuum relief fuel filler cap. 3,724,708, Cl. 200-44.00r.
Burlis, Norbert W.; and Corbett, Joseph H., to Sherwood Medical Industries, Inc. Extruding apparatus. 3,724,985, Cl. 425-132.000.
Burndy Corporation: *See*—
Feldberg, Leonard H., 3,725,842.
Burnett, Richard T., to Bendix Corporation, The. Tandem cylinder disc brake. 3,724,616, Cl. 188-345.000.
Burrough, Donald E.; Scheffler, David R.; and Seefeld, Dean E., to Gehl Company. Feed material handling apparatus. 3,724,908, Cl. 302-37.000.
Burroughs Corporation: *See*—
Balogh, Edward, Jr.; Bennett, James Russell; Keenan, William F.; Logan, William A.; and Murphy, John S., 3,725,872.
Bennett, Eugene E.; and Stansell, Alpheus F., 3,725,883.
Hauck, Erwin A., 3,725,876.
Kupsky, George A., 3,725,713.
Malmer, Michael M., Jr.; Perkins, Cornelius C.; Waldenmayer, Donald W.; Chowning, Patrick J.; and Gardner, Leonard R., 3,725,868.
Pasinski, Arthur M., 3,724,367.
Burt, F. N., Company, Inc.: *See*—
Jacobson, Leonard P., 3,724,741.
Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert, to Fisons Limited. Benzimidazole compound, method of use, and compositions. 3,725,554, Cl. 424-273.000.
Burton, Maurice G., to Ute Linter, Inc. Adjustable tilt steering device. 3,724,290, Cl. 74-493.000.
Burzan, Vernon J.: *See*—
Brooks, Howard A.; and Burzan, Vernon J., 3,724,854.
Busch, Josef; Bruck, Herbert; Schranz, Karl-Wilhelm; Schon, Erwin; and Frick, Hans-Dieter. Apparatus for processing exposed photographic film or the like. 3,724,355, Cl. 95-94.00r.
Butler, Donald E. 1-Amino-3-aminoalkyl-3-phenylindoline compounds. 3,725,436, Cl. 260-326.110.
Butler, Gene R.; and Sipe, Gary L., to Sperry Rand Corporation. Bale relocator mechanism for a bale wagon. 3,724,684, Cl. 214-6.00b.
Butler National Corporation: *See*—
Perkins, Earl Stuart; and Hobbs, James, 3,725,933.
Buttner, Rolf: *See*—
Rassbach, Felix; and Buttner, Rolf, 3,724,030.
Butts, Gary D.: *See*—
Beatty, Bobby D.; Butts, Gary D.; Herold, Stanley J.; and La Grange, Donald E., 3,724,385.
Byrd, Wylie A. Silage loader. 3,724,635, Cl. 198-9.000.
Cabell, Robert G.; Yancey, Thomas A.; Linville, Roy Norman; and Harrington, Daniel J., to Arvonia-Buckingham Slate Company, Inc. Apparatus for trimming slate. 3,724,439, Cl. 125-23.000.
Cabot Corporation: *See*—
Jordan, Merrill E.; Burbine, William G.; and Williams, Frank R., 3,725,103.
Caero, Jose G. Brake load sensing and control device. 3,724,610, Cl. 188-181.00t.
Cain, Robert L.; and Rothrock, James S., to American Gage & Manufacturing Co., The, mesne. Economy hoist. 3,724,816, Cl. 254-164.000.
Caiola, Robert J.: *See*—
Schulz, Gerald L.; and Caiola, Robert J., 3,725,109.
Calamari, Timothy A., Jr.; Schreiber, Sidney P.; Cooper, Albert S., Jr.; and Reeves, Wilson A., to United States of America, Agriculture. Chainless mercerizer suitable for use with liquid ammonia. 3,724,243, Cl. 68-244.000.
Calcagno, Benedetto: *See*—
Cavenaghi, Carlo; Di Fiore, Lucio; Barilli, Filippo; and Calcagno, Benedetto, 3,725,257.
Lugo, Luigi; Calcagno, Benedetto; and Reni, Cesare, 3,725,256.
Caldwell, Alan K., to Rewop Company. Hydraulic motor and pump system. 3,724,583, Cl. 180-66.00r.
Calistrat, Michael M., to Koppers Company, Inc. Resilient coupling. 3,724,239, Cl. 64-13.000.
Calkins, Burton H.; Carstens, Dale L.; and Riester, James J., to United States of America, Navy. Illuminating flare having high drag configuration. 3,724,375, Cl. 102-31.000.
Callan, John G., to Knox, Inc. Scanning and control apparatus. 3,724,958, Cl. 356-160.000.
Callanan, Joseph R. Self-mounting electrical connection boxes. 3,724,795, Cl. 248-360.000.
Calvert, David W.: *See*—
Smith, Leon; Calvert, David W.; Robert, Andre; Viallet, Andre; and Pauw, Daniel R., 3,725,194.
Cameron, James H.: *See*—
Tygard, Charles M.; and Cameron, James H., 3,724,067.
Campanella, Samuel Joseph; Suyderhoud, Henri George; and Onufry, Michael, Jr., to Communications Satellite Corporation. Echo suppressor break-in circuit. 3,725,612, Cl. 179-170.600.
Campbell, James K.; and Musolf, Martin C., to Dow Corning Corporation. Spandex fiber reacted with isocyanato group containing siloxane. 3,725,000, Cl. 8-115.006.
Campbell, Lewis B.; and Pietrzak, Joe P., to General Motors Corporation. Flexible grid for freezing trays. 3,724,804, Cl. 249-128.000.
Campbell, Robert W., to Phillips Petroleum Company. Polyamide fibers from mixture of 1,3-bis-(4-piperidyl) propane and bis(p-aminocyclohexyl)methane. 3,725,358, Cl. 260-78.00r.
Campbell, William S.; and von Ohain, Hans J. P., to United States of America, Air Force. Wing with thrust augmentor. 3,724,784, Cl. 244-42.0cc.
Camps, Jean-Jacques. Heating apparatus using liquid fuel. 3,724,992, Cl. 431-154.000.
Camras, Marvin, to IIT Research Institute. Magnetic transducer system with head engaging slidably supported tape loop adjacent the capstan. 3,725,608, Cl. 179-100.20c.
Camusat Gueguen France: *See*—
Guequen, Michel Marie Francois, 3,725,946.
Canada, Her Majesty the Queen in the right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Beaulieu, Alexandre J.; Fortin, Roger; Johnson, Derwyn C.; and Robinson, Alexander, 3,725,735.
Canadian International Paper Company: *See*—
Zehavi, Samuel; Boivin, Joseph J. R.; Hamilton, Douglas D.; and Ranzenhofer, Raoul, 3,724,518.
Canion, Joseph R., to Texas Instruments, Incorporated. Temperature compensated multiple character electronic display. 3,725,898, Cl. 340-324.000.
Cannon Mills Company: *See*—
Burgess, Douglas P.; and Harkey, Johnny D., 3,724,509.
Cannon, William N., to Lilly, Eli, and Company. Bis (4-amino-or 4-substituted amino-3,5-dinitrophenyl) disulfide. 3,725,479, Cl. 260-576.000.
Cant, Noel W.; and Hall, William K., to Gulf Research & Development Company. Propylene oxidation in the presence of gold metal. 3,725,482, Cl. 260-604.00r.
Cantrell, Roger E.; and Sturiale, Louis A., to Westinghouse Electric Corporation. Explosively welded plug for leaky tubes of a heat exchanger and method of using the same. 3,724,062, Cl. 29-470.100.
Capes, Charles W.: *See*—
Felcheck, Marvin; Kirschner, Wallace; Jarosik, Robert J.; and Capes, Charles W., 3,725,870.
Capps, David B.; and Erdelyi, Alexander, to Parke, Davis & Company. Organic sulfur compounds and methods for their production. 3,725,422, Cl. 260-294.80e.
Carbajal, Bernard G., III; Gosney, William Milton; and Hall, Lou H., to Texas Instruments, Incorporated. Fabrication of an insulated gate field effect transistor device. 3,724,065, Cl. 29-571.000.
Carborundum Company, The: *See*—
Economy, James; and Matkovich, Vlado I., 3,725,533.
Parris, John L., 3,724,682.
Thut, Bruno H., 3,724,877.
Cardoz, John V., to Lessona Corporation. Spinning system. 3,724,192, Cl. 57-34.00r.
Carey, Gerald D.: *See*—
Roehl, Ernest R.; and Carey, Gerald D., 3,725,913.
Carlin, Edward T.; and White, Bobby L., to Gym-Dandy, Inc. Lock joint for fabricated platform assemblies. 3,724,078, Cl. 52-177.000.
Carlson, Bertil V.: *See*—
Gallaghan, John A.; Benson, Ronald W.; and Carlson, Bertil V., 3,724,383.
Carnahan, William M. Card holder for meter readers. 3,724,744, Cl. 231-2.00e.
Caron Compactor Co.: *See*—
Caron, Fred Joseph; Caron, James Oliver; and Gray, George Carrol, 3,724,342.
Caron, Fred Joseph; Caron, James Oliver; and Gray, George Carrol, to Caron Compactor Co. Compaction wheels for earth tampers. 3,724,342, Cl. 94-50.0pr.
Caron, James Oliver: *See*—

Caron, Fred Joseph; Caron, James Oliver; and Gray, George Carrol, 3,724,342.

Carpigiani, Poerio. Soft ice product machine with heating and cooling. 3,724,235, Cl. 165-61.000.

Carr, Norman L.; Kramer, Sheldon J.; and Stahlfeld, Donald L., to Gulf Research & Development Company. Apparatus for controlling chemical processes. 3,725,653, Cl. 235-151.120.

Carre, Jean-Claude: *See—*
Pruvot, Francois C.; and Carre, Jean-Claude, 3,724,618.

Carrier Corporation: *See—*
Shulock, Charles, 3,724,969.

Carrier Engineering Company Limited: *See—*
Knight, Howard Richard James, 3,724,415.

Carrock, Frederick E., to Dart Industries Inc. Acrylonitrile-butadiene-styrene compositions. 3,725,332, Cl. 260-31.80m.

Carroll, John T., to Allis-Chalmers Corporation. Control center with expandable frame cabinet. 3,725,746, Cl. 317-120.000.

Carroll, Robert L. Bobbin adapter. 3,724,770, Cl. 242-46.600.

Carson, Walter C., to Martin Stamping & Stove Company. Counterflow fireplace. 3,724,443, Cl. 126-121.000.

Carstens, Dale L.: *See—*
Calkins, Burton H.; Carstens, Dale L.; and Riester, James J., 3,724,375.

Carstens, Marion R.; and Bates, Homer J., to Georgia Tech Research Institute. Device to stop and to change direction of vehicles in a capsule-transport pipeline. 3,724,691, Cl. 214-52.00c.

Carter, Crawford F.; and Dreher, John L., to Chevron Research Company. Complex aluminum greases having relatively constant consistency at elevated temperatures. 3,725,275, Cl. 252-21.000.

Carter, Norman D.: *See—*
Wilson, Raymond F.; Peck, Reese A.; Carter, Norman D.; Cole, Edward L.; and Hess, Howard V., 3,725,250.

Cartwright, Delmar G., to Bell Canada. Telephone transfer circuit actuated by calling signal. 3,725,594, Cl. 179-18.0ad.

Caruso, Bernard E., to Hitco. Chromium oxide coating for siliceous articles. 3,725,117, Cl. 117-100.00s.

Caruso, Philip J., Jr. Microwave radiometric aircraft landing assist system. 3,725,930, Cl. 343-100.0em.

Carver, Fred S.: *See—*
Varnum, Gordon D.; and Meylan, Charles D. (said Meylan assor. to), 3,724,819.

Casa, Fausto: *See—*
Vecellio, Bernardino; and Casa, Fausto, 3,725,177.

Case, J. I., Company: *See—*
Rhodes, Keith H., 3,724,627.

Cassady, Henry W., Jr.; and Stilwell, Robert E., to FMC Corporation. Row crop harvesting method and apparatus. 3,724,168, Cl. 53-3.000.

Cassano, James R.; and Sanza, Frank J., to Xerox Corporation. Photoreceptor loading system. 3,724,939, Cl. 355-3.000.

Cassedy, Edward S., Jr.; and Piltch, Martin. Photoelastic mode-locking of Q-switched lasers using birefringent crystals. 3,725,815, Cl. 331-94.500.

Cassel, Harrison E.: *See—*
Malta, Jacob H.; and Cassel, Harrison E., 3,725,893.

Castellarin, Albert L. Masonry laminate. 3,724,152, Cl. 52-378.000.

Castets, Michel G.M.: *See—*
Bosc, Henri J.; Castets, Michel G.M.; and Debuisser, Jean-Claude A., 3,725,923.

Castrol Limited: *See—*
Elliott, John Scotchford; Crail, Ian Robert Henry; and Jayne, Gerald John Joseph, 3,725,434.

Catalyst Research Corporation: *See—*
Moser, James R.; and Schneider, Alan A., 3,725,132.

Catena, Michael J.: *See—*
Coffey, Charles A.; and Catena, Michael J., 3,725,119.

Caterpillar Tractor Company: *See—*
Kennicutt, Robert B., 3,724,289.

Cavenaghi, Carlo; Di Fiore, Lucio; Barilli, Filippo; and Calcagno, Benedetto, to Societa Italiana Resine S.p.A. Process of separating aromatic hydrocarbons from hydrocarbon mixtures. 3,725,257, Cl. 208-331.000.

Cefilac: *See—*
Hubert, Rene, 3,724,254.

Celanese Corporation: *See—*
Holland, Charles E.; Hinson, Robert E., Jr.; and Putnam, Richard V., 3,724,196.
Jamison, Saunders E., 3,725,461.

Celanese Corporation of America: *See—*
MacLean, Alexander F.; Hobbs, Charles C., Jr.; and Dougherty, Edward F., 3,725,487.

Celanese Corpsration: *See—*
Brooks, Kenneth, 3,724,769.

Cellu Products Company: *See—*
Doll, Brendan L., 3,725,170.

Celovsky, Michael E., to Industrial Tool Engineering Company. Method of and means for separating interference fitted members. 3,724,059, Cl. 29-426.000.

Cerberus AG: *See—*
Purt, Gustav A.; and Bosshard, Walter, 3,725,011.

Cerulo, Louis J.: *See—*
Peters, Joseph C.; and Cerulo, Louis J., 3,724,638.

Cesca, Sebastiano: *See—*
Arrighetti, Sergio; Corradini, Giorgio; and Cesca, Sebastiano, 3,725,372.

Ceska, Frank Z., to Menasco Manufacturing of Canada Ltd., mesne. Oleo-pneumatic shock absorber. 3,724,832, Cl. 267-64.00r.

Ceskoslovenska akademie ved: *See—*
Serbus, Ctibor; Rezac, Jan; Pribil, Stanislav; Marvan, Petr; Krejdirik, Libor; and Stoy, Artur, 3,725,291.

Cetenko, Wiaczeslaw: *See—*
Morrison, Glenn C.; Shavel, John, Jr.; and Cetenko, Wiaczeslaw, 3,725,420.

Chadwick, Cecil George, to Union Carbide Corporation. Method of purifying low-carbon ferrochrome. 3,725,051, Cl. 75-130.500.

Chafetz, Harry: *See—*
Patmore, Edwin L.; Siegart, William R.; and Chafetz, Harry, 3,725,468.

Chaitin, Horace. Limb oscillator. 3,724,450, Cl. 128-25.00r.

Challier, Herbert. Frame construction. 3,724,678, Cl. 211-148.000.

Chamblerlin, John M., to Monsanto Company. Polymerization of ethylene. 3,725,378, Cl. 260-94.904.

Champion International Corporation: *See—*
Gaylord, Norman G., 3,725,174.

Champion Laboratories, Inc.: *See—*
Hall, Robert L., 3,724,665.

Chang, Thomas M. S., to Research Corporation. Blood compatible microencapsulated detoxicants and method for making. 3,725,113, Cl. 117-82.000.

Chapman, Joseph E., III, to Schlumberger Technology Corporation. Well logging methods and apparatus. 3,724,589, Cl. 181-.5bi.

Chase, Raymond Burt. Adherent resin with release surface. 3,725,105, Cl. 117-2.00r.

Chaulet, Roger Louis; Guichard, Claude Pierre Albert Louis; Meniasier, Pierre Lucien; and Soret, Jean-Claude Georges, to Societe Anonyme Societe Industrielle de Combustible Nucleaire. Plant for continuous vacuum casting of metals or other materials. 3,724,29, Cl. 164-154.000.

Checchetti, Claudio. Table soccer or football game structure. 3,724,851, Cl. 273-85.00d.

Chemagro Corporation: *See—*
Newallis, Peter E.; Poje, Albert J.; and Epstein, Peter F., 3,725,030.

Chemiebau, Dr. A. Zieren, G.m.b.H. & Co., K.G.: *See—*
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert, 3,725,211.

Chemische Fabrik Kalk GmbH: *See—*
Jenkner, Herbert, 3,725,316.

Chemische Fabrik Pfersee GmbH: *See—*
Bernheim, Willy; and Deiner, Hans, 3,725,502.

Chemotronics, Incorporated: *See—*
Wolf, James M., 3,725,002.

Chenut, Gabriel. Postal meter with letter weight checking device. 3,724,570, Cl. 177-4.000.

Chervenak, John, to United States of America, Navy. Push-pull transducer. 3,725,856, Cl. 340-8.00r.

Chervenak, Michael C.: *See—*
Alpert, Seymour B.; Wolk, Ronald H.; Chervenak, Michael C.; and Nongbri, Govanon, 3,725,251.

Chervenak, Michael C., to Hydrocarbon Research, Inc. Solids removal from hydrogenated coal liquids. 3,725,241, Cl. 208-10.000.

Chevreux, Gerard, to Societe Anonyme D.B.A. Braking control system. 3,724,911, Cl. 303-13.000.

Chevron Research Company: *See—*
Carter, Crawford F.; and Dreher, John L., 3,725,275.
Jennings, Harley Y., Jr., 3,724,546.

Chiasson, Randall J.; Bourg, Ronald G.; and Arceneaus, Tilton J. Floating fire extinguishing apparatus and catch basin. 3,724,555, Cl. 169-2.00r.

Chicago Bridge & Iron Company: *See—*
Maher, James Bernard; and Sudduth, Jackie Wayne, 3,724,227.

Chick, Joseph James: *See—*
Fernald, Charles Henry; and Chick, Joseph James, 3,724,054.

Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Mukai, Takuma; Nakazima, Atushi; and Sakunaga, Kenichi, to Mitsubishi Rayon Co., Ltd. Continuous process for relaxing heat treatment and apparatus therefor. 3,724,038, Cl. 28-1.200.

Chinuki, Takashi: *See—*
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.

Chippendale, John, to Impact Industrial Holdings Limited. Cable splitter. 3,724,310, Cl. 83-435.000.

Chiron, Bernard; and Puyhaubert, Jean, to Societe Lignes Telegraphiques et Telephoniques. Point-contact-electrode driven microwave electroacoustic transducer. 3,725,826, Cl. 333-30.000.

Choate, William C.; and Masten, Michael K., to Texas Instruments, Incorporated. Probability sort in a storage minimized optimum processor. 3,725,875, Cl. 340-172.500.

Chonan, Takayuki: *See—*
Kawano, Akira; Sakakibara, Kozo; Abe, Iwao; and Chonan, Takayuki, 3,725,472.

Chorney, Frederick R. Recovery of calcium mahogany sulfonate. 3,725,467, Cl. 260-504.00a.

Chow, Roberta C. L.: *See—*
Marvel, Carl S.; and Chow, Roberta C. L., 3,725,442.

Chowning, Patrick J.: *See—*
Malmer, Michael M., Jr.; Perkins, Cornelius C.; Waldenmayer, Donald W.; Chowning, Patrick J.; and Gardner, Leonard R., 3,725,868.
Christenson, Roger M.; and Anderson, Carl C., to PPG Industries, Inc. Pressure-sensitive adhesive articles and method of making same. 3,725,115, Cl. 117-93.310.
Christian, John B., to United States of America, Air Force. Grease composition. 3,725,273, Cl. 252-13.000.
Christiania Spigerverk: *See—*
Kasin, Hans; and Thvedt, Krane, 3,724,587.
Chromalloy American Corporation: *See—*
Mal, M. Kumar; and Tarkan, Stuart E., 3,725,016.
Chu, Kwang Yup. Basketball game. 3,724,855, Cl. 273-101.000.
Chvertko, Anatoly Ivanovich: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,725,559.
Chyung, Chi-Kwun; and Rittler, Hermann L., to Corning Glass Works. Glass-ceramic metal cermets and method. 3,725,091, Cl. 106-39.0dv.
Ciba-Geigy AG: *See—*
Beriger, Ernst, 3,725,513.
Janiak, Stefan, 3,725,428.
Meier, Max, 3,725,068.
Porret, Daniel; and Habermeier, Juergen, 3,725,342.
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, 3,725,395.
Zickendraht, Christian; and Fasciati, Alfred, 3,725,384.
Ciba-Geigy Corporation: *See—*
Dietrich, Henri, 3,725,430.
Gschwend, Heinz Werner, 3,725,431.
Konopka, Edward Alexander; and Gelzer, Justus Melchior, 3,725,543.
Schindler, Walter; Schmid, Erich; and Zuest, Armin, 3,725,411.
Traber, Walter; and Weiss, Anton G., 3,725,555.
Voser, Walter, 3,725,400.
Ciba-Geigy Marienberg GmbH: *See—*
Weisfeld, Lewis B.; Andreas, Holger; and Muller, Horst, 3,725,338.
Cincinnati Milacron Inc.: *See—*
Kaesemeyer, Carl W., 3,724,335.
Yates, Edward W., 3,724,328.
Cirino, John C., to Siles, Gregory, Co. Motion sensitive alarm system. 3,725,890, Cl. 340-262.000.
Cities Service Company: *See—*
Barker, James E., 3,725,535.
Olechowski, Jerome Robert, 3,725,371.
Olechowski, Jerome Robert, 3,725,477.
Cities Service Oil Company: *See—*
Pelofsky, Arnold H., 3,725,314.
Citrus State of Florida, Department of: *See—*
Barron, Rodger W.; Fellers, Paul J.; and Huggart, Richard L., 3,725,083.
Civitarese, Joseph A. Conveyor suspension track and trolley system. 3,724,387, Cl. 104-93.000.
Clark, Charles William, to Borden, Inc. Cap tester. 3,724,655, Cl. 209-73.000.
Clark Equipment Company: *See—*
Conrad, Marcus L., 3,724,585.
Clark Equipment Company, mesne: *See—*
Brownell, Roy D.; and Rogers, Richard E., 3,724,679.
Clark, Harry C. Tooth for backhoe bucket. 3,724,899, Cl. 299-26.000.
Clark, Robert A.; and Helgeson, Peter L., to Raytheon Company. Portable oven. 3,724,440, Cl. 126-9.00r.
Clark, William A., IV; Salmond, Kent A.; and Stafford, Thomas S., to International Business Machines Corporation. Input/output control. 3,725,864, Cl. 340-172.500.
Clarke, Reginald L.: *See—*
Fahey, Denis; and Clarke, Reginald L., 3,724,146.
Clauss, Julius A., Jr.; Conley, Jack S.; and Lemon, Robert W., to Borg-Warner Corporation. Transmission. 3,724,626, Cl. 192-109.00f.
Clausse, Georges Jean Louis, to Hoover Company, The. Liquid heating units, control means for such units and vessels incorporiting heating units. 3,725,643, Cl. 219-441.000.
Clayton, Eric Arthur, to Hudswell Yates Developments Limited. Mole plow depth adjustment apparatus. 3,724,108, Cl. 37-193.000.
Clayton, Keith P.: *See—*
Kaywood, Roy H.; Kaywood, Roy G.; and Clayton, Keith P., 3,724,151.
Cleverley, Sidney B. Portable loom. 3,724,041, Cl. 28-15.000.
Clouth Gummiwerke Aktiengesellschaft: *See—*
Spaar, Gerd, 3,724,645.
Coddington, David M.; Marsh, William D.; and Cohen, Harvey, to Esso Research and Engineering Company. Anti-flat device. 3,724,521, Cl. 152-340.000.
Coffey, Charles A.; and Catena, Michael J., to Harris Paint Company. Method for decorating surfaces. 3,725,119, Cl. 117-104.00r.
Cohen, Harvey: *See—*
Coddington, David M.; Marsh, William D.; and Cohen, Harvey, 3,724,521.
Cojafex N.V.: *See—*
Hofstede, Marinus Johannes; and Logman, Hendrik, 3,724,258.
Cole, Edward L.: *See—*
Wilson, Raymond F.; Peck, Reese A.; Carter, Norman D.; Cole, Edward L.; and Hess, Howard V., 3,725,250.
Cole, Edward N., to General Motors Corporation. Engine exhaust reactor and method of making. 3,724,218, Cl. 60-282.000.
Cole, Frank J.: *See—*
Roblin, John M.; Cole, Frank J.; and Bourne, James G., 3,725,045.
Colgate-Palmolive Company: *See—*
Bechtold, Charles Louis, 3,725,288.
Judd, Claude I.; and Hoya, Wallace K., 3,725,419.
Skorcz, Joseph A.; Suh, John T.; and Judd, Claude I., 3,725,426.
Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., 3,725,473.
Colline, Raymond M.: *See—*
Haller, Willis D.; and Colline, Raymond M., 3,725,126.
Collins Radio Company: *See—*
Temes, Gabor C., 3,725,828.
Collins, William. Roller assembly. 3,724,629, Cl. 193-35.00r.
Collis, Michael Edward Richard, to Vosper Thornycroft Limited. Cloth impregnating machine. 3,724,419, Cl. 118-119.000.
Colston, John Matthew; and Machin, James Robert, to Elliott Brothers (London) Limited. Graphic display system. 3,725,723, Cl. 315-22.000.
Colts Industries Operating Corporation, mesne: *See—*
Silsby, Stanley D., 3,724,325.
Columbo, Christopher. Finger training device for stringed musical instruments. 3,724,314, Cl. 84-465.000.
Columbus McKinnon Corporation: *See—*
Hawkins, Harold V.; Dick, Ralph A.; and Parlow, Alfred M., 3,724,815.
Combustion Engineering, Inc.: *See—*
Notari, Gennaro V.; and Rickert, Royce J., 3,725,199.
Commissariat a l'Energie Atomique: *See—*
Barrot, Jean-Pierre; Negrou, Jacques; and Pelte, Charles, 3,725,785.
Bonjour, Emmanuel; and Couach, Michel, 3,724,820.
Bourgoin, Gerard; Kumurdjian, Pierre; Loitiere, Alain; and Pere, Jean-Francois, 3,725,685.
Communications Satellite Corporation: *See—*
Campanella, Samuel Joseph; Suyderhoud, Henri George; and Onufry, Michael, Jr., 3,725,612.
Compagnie des Freins et Signaux Westinghouse: *See—*
Levy, Jose, 3,724,913.
Compagnie Generale d'Electricite: *See—*
Lenfant, Rene; and Petitjean, Guy, 3,724,924.
Varichon, Claude, 3,724,584.
Compagnie Industrielle des Telecommunications CIT ALCATEL: *See—*
Melchior, Gerard, 3,725,676.
Compagnie Industrielle des Telecommunications CIT-ALCATEL: *See—*
Friberg, Jean-Marie; Maginot, Pierre; and Merigoux, Jean-Marie, 3,724,968.
Compton, Donald M. Dice tumbling chamber with timer. 3,724,847, Cl. 273-1.00r.
Computer Management Systems, Inc.: *See—*
Albertini, Eugene J.; and Shu, Stephen K., 3,725,947.
Computer Optics, Inc.: *See—*
Dell, Brian E., 3,725,575.
Congoleum Industries, Inc.: *See—*
Winters, Donald C., 3,725,196.
Congro, Peter Leo. Dual inhaler. 3,724,459, Cl. 128-200.000.
Conix, Andre Jan: *See—*
Verhille, Karel; and Conix, Andre Jan, 3,725,061.
Conklin, George L.: *See—*
McCaully, Ronald J.; Bell, Stanley C.; and Conklin, George L., 3,725,389.
Conley, Jack S.: *See—*
Clauss, Julius A., Jr.; Conley, Jack S.; and Lemon, Robert W., 3,724,626.
Conrad, George: *See—*
Genzer, Jerome; and Conrad, George, 3,725,413.
Conrad, Marcus L., to Clark Equipment Company. Fluid steering system. 3,724,585, Cl. 180-79.20c.
Consulting Specialists, Inc.: *See—*
Marks, Ronald A., 3,725,886.
Container Corporation of America: *See—*
Staar, Anthony J.; and Spence, Gerald D., 3,724,712.
Continentah Oih Company: *See—*
Durr, Albert M., Jr.; and Meador, William R., 3,725,280.
Continental Can Company, Inc.: *See—*
Morgese, Nicholas V., 3,724,653.
Continental Carbon Company: *See—*
Le Boeuf, Joe S., 3,724,178.
Continental Oil Company: *See—*
Starks, Charles M., 3,725,458.
Control Data Corporation: *See—*
Brisebarre, Marcel; and de Saint Sauveur, Xavier, 3,725,908.
Controls Company of America: *See—*
Obermann, George, 3,724,248.
Conway, Richard F.: *See—*
Rydeski, Roman R.; and Conway, Richard F., 3,725,084.
Conwed Corporation: *See—*
Gaffney, Bernard J., 3,725,518.
Coogan, Joseph E., III: *See—*

Stefanucci, Arthur; Harnisch, Douglas R.; Coogan, Joseph E., III; and Scarsella, Edward L., 3,725,076.

Cook, Harold E.; and Lanier, Harold H., to Batson-Cook Company. Stop motion device with selective indicator. 3,725,911, Cl. 340-415.000.

Cooke, Gerhart M., to Aeroquip Corporation. Flow measurement and control. 3,724,503, Cl. 138-45.000.

Cookson Sheet Metal Developments Limited: *See*—
Cookson, William, 3,724,154.

Cookson, William, to Cookson Sheet Metal Developments Limited. Fixing devices for roofing and siding sheets. 3,724,154, Cl. 52-480.000.

Cool, Arthur R. Water current directing apparatus. 3,724,221, Cl. 61-4.000.

Cooper, Albert S., Jr.: *See*—
Calamari, Timothy A., Jr.; Schreiber, Sidney P.; Cooper, Albert S., Jr.; and Reeves, Wilson A., 3,724,243.

Cooper, Dexter P., Jr.: *See*—
Lancor, Joseph H., Jr.; and Cooper, Dexter P., Jr., 3,724,343.

Cooper, Kenneth C.: *See*—
Neudecker, Joseph W.; and Cooper, Kenneth C., 3,724,215.

Coran, Aubert Y.: *See*—
Boustany, Kamel; and Coran, Aubert Y., 3,725,361.

Corbett, Joseph H.: *See*—
Burlis, Norbert W.; and Corbett, Joseph H., 3,724,985.

Cordelle, Claude: *See*—
Maringer, Robert; and Cordelle, Claude, 3,724,979.

Coren, Harry. Material disposal assembly. 3,724,713, Cl. 220-71.000.

Corl, John E.: *See*—
Hofelt, Clarence, Jr.; and Corl, John E., 3,724,137.

Corning Glass Works: *See*—
Chyung, Chi-Kwun; and Rittler, Hermann L., 3,725,091.

Cornsweet, Tom N.; and Crane, Hewitt D., to Stanford Research Institute. Eye tracker and method. 3,724,932, Cl. 351-7.000.

Corradini, Giorgio: *See*—
Arrighetti, Sergio; Corradini, Giorgio; and Cesca, Sebastiano, 3,725,372.

Corry, Thomas M., to General Motors Corporation. Method of and apparatus for generating three-phase sinusoidal voltages. 3,725,767, Cl. 321-5.000.

Cosme, Peter A.: *See*—
Holtzman, Samuel J.; and Cosme, Peter A., 3,724,057.

Cottle, John E., to Phillips Petroleum Company. Process for polymerizing 1-3-butadiene monomer. 3,725,377, Cl. 260-94.20r.

Cotton, Louis S.: *See*—
Adams, Don L.; and Cotton, Louis S., 3,724,786.

Couach, Michel: *See*—
Bonjour, Emmanuel; and Couach, Michel, 3,724,820.

Coulombe, Lionel J.: *See*—
Marsh, Walter H. W.; and Coulombe, Lionel J., 3,724,404.

Coury, Arthur J.; and Rogier, Edgar R., to General Mills Chemicals, Inc. Process for the preparation of isocyanates from acyl azides. 3,725,450, Cl. 260-453.00p.

Cowan, Arnold A., to De Laval Turbine Inc., mesne. Proportioning solenoid. 3,725,747, Cl. 317-123.000.

Cox, Arthur, to Bell & Howell Company. Optical zoom and image-rotating system. 3,724,927, Cl. 350-203.000.

Cox, Philip P., to Dranetz Engineering Laboratories Inc. Phase meter with noise error reduction means. 3,725,781, Cl. 324-83.00a.

Cox, Robert M.; Crowley, Ernest W.; and Kilmer, Dan L., to Servo Labs, Inc. Flow controller. 3,724,485, Cl. 137-117.000.

Crabtree, Allen: *See*—
Austin, Peter William; Crabtree, Allen; Leng, John Lindley; Robert, Denis; Ridyard, Annesley; and Young, Elliott, 3,725,383.

Craford, Magnus George: *See*—
Groves, Warren Olley; Herzog, Arno Henry; and Craford, Magnus George, 3,725,749.

Craig, Gale M., to General Motors Corporation. Moisture barrier for sealed beam headlamp construction. 3,725,698, Cl. 240-41.0sb.

Crail, Ian Robert Henry: *See*—
Elliott, John Scotchford; Crail, Ian Robert Henry; and Jayne, Gerald John Joseph, 3,725,434.

Crain, Graydon H. Mooring structure and method. 3,724,222, Cl. 61-46.000.

Cramer, Deane G., to PPG Industries, Inc. Window structure. 3,725,028, Cl. 65-182.00r.

Crane Co.: *See*—
Hirzel, Edgar A., 3,724,916.

Crane, Hewitt D.: *See*—
Cornsweet, Tom N.; and Crane, Hewitt D., 3,724,932.

Crawford, Jack A.; Lewis, George R.; and Woodworth, William H., to United States of America, Navy. Television tracking system. 3,725,576, Cl. 178-6.800.

Creusot-Loire Entreprises: *See*—
Gay, Pierre, 3,724,735.

Cristie, Martin, to Stelber Industries Inc. Convertible bicycle. 3,724,865, Cl. 280-7.110.

Cromer, Charles F.: *See*—
Fischer, William H.; and Cromer, Charles F., 3,725,623.

Cronberg, Alvin Dale: *See*—
Hartlage, James Albert; and Cronberg, Alvin Dale, 3,725,046.

Crovetti, Aldo Joseph: *See*—
Von Esch, Anne Mary; and Crovetti, Aldo Joseph, 3,725,424.

Crowden, William F.: *See*—
Frigo, Richard J.; and Crowden, William F., 3,724,313.

Crowder, William E. Tethered projectile having loop and pocketed targets. 3,724,853, Cl. 273-98.000.

Crowe, Larry G. Pipe having disposable protective means thereon and method of making same. 3,724,506, Cl. 138-96.000.

Crowley, Ernest W.: *See*—
Cox, Robert M.; Crowley, Ernest W.; and Kilmer, Dan L., 3,724,485.

Crown, William A.: *See*—
Long, Marvin B.; and Crown, William A., 3,724,182.

Crum, James N.: *See*—
Schaffer, Robert H.; and Crum, James N., 3,724,733.

CSF-Compagnie Generale de Telegraphie Sans Fil: *See*—
Biguenet, Charles, 3,724,049.

Cubbison, Richard James, Jr., to Bell Telephone Laboratories, Incorporated. Pole frequency stabilized active RC filter. 3,725,799, Cl. 330-21.000.

Culley, John C., to United States of America, Atomic Energy Commission. Thermoluminescence dosimeter system. 3,725,659, Cl. 250-71.00r.

Culver, Irven H., to Primus Mfg., Inc., mesne. Flexure mounting for friction-wheel measurement device. 3,724,082, Cl. 33-141.00e.

Cummisford, Robert G., to Krause Milling Company. Art of manufacturing dry wall taping and finishing compounds with a nitrogenous-modified amylaceous binder. 3,725,324, Cl. 260-17.4st.

Cupler, John A., II. Apparatus for conducting machining and/or assembly operations. 3,724,044, Cl. 29-26.00a.

Cupples Container Co.: *See*—
Ronden, Clifford P.; and Roylance, Donald C., 3,725,317.

Curran, Patrick M.: *See*—
Erickson, John S.; Curran, Patrick M.; and Owczarski, William A., 3,724,531.

Curran, Robert N.: *See*—
Brunson, Glenn S.; Curran, Robert N.; and Just, Franklin H., 3,725,688.

Curry, David B. Safety device for gas lift well. 3,724,541, Cl. 166-224.000.

Curtis, Frank W., to Lexsuco, Inc. Protected structural and construction materials. 3,725,185, Cl. 161-89.000.

Cutler, Earl F., to Cutler Repaving Inc. Heater for asphalt concrete roadways and the like. 3,724,445, Cl. 126-271.20a.

Cutler, Hymie, to Bendix Corporation, The. Numerical control system for a lathe. 3,725,651, Cl. 235-151.110.

Cutler Repaving Inc.: *See*—
Cutler, Earl F., 3,724,445.

Cutler, Thomas P., to Sanders Associates, Inc. Post storage range and doppler correlation method and apparatus. 3,725,916, Cl. 343-5.0dp.

Cycle-Dyne, Inc.: *See*—
Gagliardi, Nicholas, 3,725,630.

Cyclotron Corporation, The: *See*—
Hendry, George O.; and Wells, Dale K., 3,725,709.

Da-Lite Screen Company, Inc.: *See*—
Potter, Fred S., 3,724,524.

Dahl, Hans; and Kurz, Anton, to Escher Eyss GmbH. Headbox for a paper making machine containing multiple parallel ducts. 3,725,197, Cl. 162-343.000.

Dahl, Rulon R., to Killebrew, Inc. Method of making combined catcher/projector for aerial projectiles. 3,724,058, Cl. 29-417.000.

Daicel Ltd.: *See*—
Kawano, Akira; Sakakibara, Kozo; Abe, Iwao; and Chonan, Takayuki, 3,725,472.

Daimler Benz Aktiengesellschaft: *See*—
Brand, Oskar, 3,724,895.

Daimler-Benz Aktiengesellschaft: *See*—
Andres, Rudolf; Stolz, Albert; and Moller, Hermann, 3,724,752.
Gaus, Hermann, 3,724,294.
Schutzenauer, Hans-Dieter, 3,724,481.

Dalziel, Thomas: *See*—
Masters, Leonard Kenneth Morgan; and Dalziel, Thomas, 3,724,359.

Daman, Louis F., to Singer Company, The. Cam follower release mechanism for sewing machines. 3,724,282, Cl. 74-54.000.

D'Amato, Salvatore F.; Guertin, Clifford D.; and Lednicer, Oliver, to American Bank Note Company. Portable lamp for viewing fluorescent material. 3,725,694, Cl. 240-6.40r.

Dambrine, Francis: *See*—
Retali, Roger; Dambrine, Francis; Giorgi, Jean Claude; and Windal, Georges, 3,725,127.

Damon Corporation: *See*—
Peters, Joseph C.; and Cerulo, Louis J., 3,724,638.

D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, to Pennwalt Corporation. Peroxy compounds containing a carbonate group. 3,725,455, Cl. 260-463.000.

Daniel, Dorce L. Apparatus for anchoring a structure to earth matter. 3,724,145, Cl. 52-157.000.

Dappen, Glen M.: *See*—
Wolfarth, Eugene F.; Smith, Donald A.; Farran, Charles F.; and Dappen, Glen M., 3,725,063.

Darlington, Sidney, to Bell Telephone Laboratories, Incorporated. Distortion reduction in a repeatered transmission system. 3,725,806, Cl. 330-149.000.

Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe signal shaping circuit. 3,725,679, Cl. 307-268.000.

Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe electronic band-pass filter. 3,725,802, Cl. 330-31.000.
Dart Industries Inc.: *See—*
Carrock, Frederick E., 3,725,332.
Wainwright, Ralph E.; and Liston, Edward R., 3,724,641.
Wang, Jerry Chi, 3,725,320.
Dart Industries, Inc., mesne: *See—*
Huerta, James R.; and Meyer, Jeffrey G., 3,725,444.
Davidson, Cliff I.; and Laing, Charles F., to Westinghouse Electric Corporation. Measurement of temperature inversions. 3,725,914, Cl. 343-5.00w.
Davidson, William E., to General Electric Company. Attachment plug with cord grip. 3,725,848, Cl. 339-62.000.
Davies, Robert William, to Molins Limited. Apparatus for applying tear strips to wrappers. 3,725,181, Cl. 156-519.000.
Davies, Roy E.: *See—*
Gessner, Richard W.; and Davies, Roy E., 3,725,134.
Davis, Dale M., to United States of America, Air Force. Warhead for guided missiles. 3,724,379, Cl. 102-49.300.
Davis, Gordon Jerry, to Maytag Company, The. Washing additive dispenser. 3,724,242, Cl. 68-17.00a.
Davis, Neville Ryland. Current-operated switch. 3,725,670, Cl. 307-117.000.
Davis, Paul, to Sweetheart Plastics, Inc. Container lid. 3,724,710, Cl. 220-60.00r.
Davis, Walter F. Candle mould. 3,724,982, Cl. 425-117.000.
Davis, William John, to RCA Corporation. Simultaneous digital transmission in both directions over one line. 3,725,582, Cl. 178-58.000.
Dawans, Francois: *See—*
Lesage, Jean; and Dawans, Francois, 3,725,331.
Day, John J.; and Hirschman, Paul S., to Ocean Protein Corporation. Apparatus for growing crustaceans. 3,724,423, Cl. 119-4.000.
Day, Robert W. Sub-caliber conversion unit. 3,724,326, Cl. 89-196.000.
Dayco Corporation: *See—*
Kleykamp, Donald L.; Gaster, Ivan; Browning, Vernon D.; and Holden, Homer N., 3,724,507.
De Gier, Johannes; and Eisses, Reinhart Charles Willem, to U.S. Philips Corporation, mesne. Method of making a cathode-ray tube. 3,725,710, Cl. 313-64.000.
De Good, Marnard J., to Rapistan Incorporated. Accumulator with braking. 3,724,642, Cl. 198-127.00r.
De Laval Turbine Inc., mesne: *See—*
Cowan, Arnold A., 3,725,747.
De Marco, John Gregory, to American Cyanamid Company. Process for methoxyethyl carbamate. 3,725,464, Cl. 260-482.00c.
de Montigny, Raimbault M.A.T.; Liebergott, Norman; and Pounds, Derrick P.W., to Pulp and Paper Research Institute of Canada. Process and apparatus for the chemical reaction between a gas and a wood pulp. 3,725,193, Cl. 162-17.000.
de Nora, Vittorio; and Trisoglio, Giovanni, to Electronor Corporation. Baffles for dimensionally stable metal anodes and methods of using same. 3,725,223, Cl. 204-99.000.
De Puy, Robert P., to General Electric Company. Digital regulator and method of current regulation. 3,725,769, Cl. 321-14.000.
de Saint Sauveur, Xavier: *See—*
Brisebarre, Marcel; and de Saint Sauveur, Xavier, 3,725,908.
De Vale, Donald P., to Halogen Controls, Inc. Apparatus for monitoring and controlling halogen levels in a water treatment system. 3,724,474, Cl. 137-5.000.
Deaton, Ronald L.; and Silver, Gary L., to United States of America, Atomic Energy Commission. Method for dissolving plutonium dioxide. 3,725,294, Cl. 252-301.10r.
Debuisser, Jean-Claude A.: *See—*
Bosc, Henri J.; Castets, Michel G.M.; and Debuisser, Jean-Claude A., 3,725,923.
Decca Limited: *See—*
Hughes, David Geoffrey, 3,725,932.
Deerfield, Alan J., to Raytheon Company. Floating point number processor for a digital computer. 3,725,649, Cl. 235-156.000.
Deffner, John F.; Tucci, Edmond R.; Thayer, Helen I.; and Ward, John V., to Gulf Research and Development Company. Process for the hydroformylation of olefins. 3,725,483, Cl. 260-604.0hf.
Dehar, David C., to Ford Motor Company. Tube-to-hose connection. 3,724,882, Cl. 285-243.000.
Deiner, Hans: *See—*
Bernheim, Willy; and Deiner, Hans, 3,725,502.
Del Giudice, Frank Paul: *See—*
Koleske, Joseph Victor; Roberts, Rene Marie-Joseph; and Del Giudice, Frank Paul, 3,725,352.
Delaunay, Jacques, to Societe de Fabrication d'Instruments de Mesure SFIM. Electronic devices for forming algebraic sums. 3,725,691, Cl. 235-186.000.
Dell, Brian E., to Computer Optics, Inc. Image transfer device. 3,725,575, Cl. 178-6.70r.
Dell, Ronald Michael: *See—*
Woodhead, James Louis; Dell, Ronald Michael; Junkinson, Anthony Richard; and Wilkinson, Raymond Westrop, 3,725,298.
Dellor, Roger B., to Intersil Incorporated. Two terminal bipolar memory cell. 3,725,881, Cl. 340-173.0ff.
Delro Engineering Corporation: *See—*
Bennett, Delora E.; and Packard, Roger A., 3,724,014.
Denk, Hans H.; and Sabad, Joseph J., to International Business Machines Corporation. Magnetic coating compositions. 3,725,285, Cl. 252-62.540.
Denker, James M., to Nutron Corporation. Mechanical driving. 3,724,334, Cl. 91-491.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Horiie, Shigeki; Morikawa, Hiroyasu; Fujii, Chiyuki; Kobayashi, Teruo; Kohno, Susumu; and Ono, Toru, 3,725,443.
Dennis, John M., Jr., to Shane, Charles. Preleaded drainpipe connector. 3,724,883, Cl. 285-291.000.
DePree, David O., to Aerojet-General Corporation. Process for recovery of mineral pollutants from acidic waste streams. 3,725,259, Cl. 210-30.000.
Derie, Clifford. Fishing device. 3,724,115, Cl. 43-15.000.
Derksen, Evert Hermanus: *See—*
Boose, Cesar Adrianus; Reidt, Maarten Johan; and Derksen, Evert Hermanus, 3,725,137.
Derr, Vincent H.: *See—*
Edwards, Norman W.; Derr, Vincent H.; and Mattson, Richard A., 3,724,704.
Desty, Denis Henry. Burner. 3,724,994, Cl. 431-328.000.
Detachable lamp socket assembly: *See—*
Izumi, John, 3,725,850.
Detman, Kenneth D. Ventilated, shaded, waterproof roof structure. 3,724,149, Cl. 52-22.000.
Detrex Chemical Industries, Inc.: *See—*
McCracken, William L.; Petering, Wilbur H.; Kircher, Charles E., Jr.; and Pinchak, Paul R., 3,725,486.
Dever, James L.; and Hodan, James J., to Borg-Warner Corporation, mesne. Phosphite-phosphates. 3,725,510, Cl. 260-927.00r.
DeVilliers, John Laddier. Valves. 3,724,498, Cl. 137-607.000.
Devlieg Machine Company: *See—*
Green, George C., 3,724,965.
D'Heurle, Francois M.: *See—*
Ames, Irving; D'Heurle, Francois M.; and Horstmann, Richard E., 3,725,309.
Di Biago, Luciano: *See—*
Palombari, Maurizio; and Di Biago, Luciano, 3,725,591.
Di Fiore, Lucio: *See—*
Barilli, Filippo; Lugo, Luigi; Di Fiore, Lucio; and Reni, Cesare, 3,725,255.
Cavenaghi, Carlo; Di Fiore, Lucio; Barilli, Filippo; and Calcagno, Benedetto, 3,725,257.
Diamond, Harold G.; and Gustine, Floyd L., to Allis-Chalmers Manufacturing Company. Electrostatic resin powder spray system having improved powder dispensing means. 3,724,416, Cl. 118-7.000.
Diamond, Harold G.; and Gustine, Floyd L., to Allis-Chalmers Corporation. Powder-air venturi for electrostatic spray coating system. 3,724,755, Cl. 239-15.000.
Dick, Ralph A.: *See—*
Hawkins, Harold V.; Dick, Ralph A.; and Parlow, Alfred M., 3,724,815.
Diebold Incorporated: *See—*
Kohl, Robert E., 3,724,643.
Diesel Kiki Kabushiki Kaisha: *See—*
Inoue, Takashi; Masuda, Takao; and Harada, Takeshi, 3,724,431.
Dietrich, Henri, to Ciba-Geigy Corporation. Derivatives of p-aminoalkyl benzenesulfonamides. 3,725,430, Cl. 260-309.700.
Dilick, Maurice D.: *See—*
Leonard, Stephen C.; and Dilick, Maurice D., 3,725,778.
Dill, Walter R., to Halliburton Company. Oil soluble diverting material and method of us for well treatment. 3,724,549, Cl. 166-282.000.
Dille, Roger M.: *See—*
Tassoney, Joseph P.; and Dille, Roger M., 3,725,270.
Dimmick, Roger F., to International Business Machines Corporation. Pneumatic valve. 3,724,479, Cl. 137-83.000.
Disselnkotter, Hans, to Farbenfabriken Bayer Aktiengesellschaft. 3-Substituted-6-chloro-2H-1, 3-oxazine-2,4 (3H)-dione. 3,725,402, Cl. 260-244.00r.
Dixon, Amers Ernest; and Proctor, Michael. Splints. 3,724,453, Cl. 128-87.00r.
Dixon, Don P.; and Bertva, John T. Automobile air conditioning system. 3,724,232, Cl. 62-244.000.
Dobring, Wilfried: *See—*
Koppen, Gerhard; Dobring, Wilfried; and Siebart, Manfred, 3,725,839.
Dodewaard, Johan Ledoux. Storage container for small articles. 3,724,647, Cl. 198-220.0bc.
Dogane, Iwao: *See—*
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chimuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.
Doherty, William F., to Pyrotector, Incorporated. Fire detector with red and blue responsive photocells and regenerative feedback. 3,725,660, Cl. 250-83.30h.
Doiuchi, Toru: *See—*
Fujimoto, Yasuo; Masumura, Isao; Tatsukawa, Keizo; Koshimoto, Shinsuke; and Doiuchi, Toru, 3,725,353.
Doll, Brendan L., to Cellu Products Company. Method of and apparatus for forming corner pads. 3,725,170, Cl. 156-217.000.
Domenico, Penelope B., to Dow Chemical Company, The. (Thio-,sulfinyl-and sulfonyl) containing pyridine compounds. 3,725,421, Cl. 260-294.80f.

Dominion Engineering Works, Limited: *See*—
Sproule, Robert Stanley, 3,724,966.

Donahue, William J., to United States of America, Navy. Centrifugally armed fuze. 3,724,384, Cl. 102-79.000.

Donche, Alain; Thibault, Claude; Arretz, Emmanuel; and Pfister, Alain, to Societe Nationale des Petroles d'Aquitaine. Methylenedithiolans. 3,725,394, Cl. 260-240.00f.

Donner, Siegmar, to Kieninger & Oberfell, Firma. Electronic clock with low power consumption. 3,724,200, Cl. 58-41.00r.

Donohue, Paul Christopher, to Du Pont de Nemours, E. I., and Company. Semiconducting cadmium, cadmium-zinc, and mercury phosphide halides. 3,725,310, Cl. 252-518.000.

Dooley, Eddie W., to General Electric Company. Latching device. 3,724,889, Cl. 292-87.000.

Dorchester, Edwin B. Vernier control knob. 3,724,281, Cl. 74-10.520.

Dorion, Francis W., Jr., to Gillette Company, The. Dual razor blade assembly. 3,724,070, Cl. 30-47.000.

Dorken & Mankel KG: *See*—
Tillmann, Horst, 3,724,023.

Dornier AG: *See*—
Buchstaller, Anton, 3,724,785.

Dorsey, Robert L., Sr.; Gross, James C.; and Myers, H. George. Electric switches. 3,725,834, Cl. 337-44.000.

Dortenzo, Alexander T., to Pennsylvania Engineering Corporation. Anti-pollution device for a metallurgical vessel. 3,724,827, Cl. 266-15.000.

Dossett, Lawrence S.: *See*—
Hager, George S.; Keech, Eugene E.; and Dossett, Lawrence S., 3,724,772.

Dotson and Evans, Inc.: *See*—
Dotson, George L., 3,724,799.

Dotson, George L., to Dotson and Evans, Inc. Ring display device. 3,724,799, Cl. 248-450.000.

Dotzauer, Bernhard: *See*—
Reinhard, Hans; Mueller, Alfred; and Dotzauer, Bernhard, 3,725,122.

Dougherty, Edward F.: *See*—
MacLean, Alexander F.; Hobbs, Charles C., Jr.; and Dougherty, Edward F., 3,725,487.

Douglas, Bobby L., to Dresser Industries, Inc. Liquid separation in a well. 3,724,486, Cl. 137-190.000.

Douros, John D., Jr.; and Kerst, Al Fred, to Gates Rubber Company, The. Alloxantin compounds as antibacterial and antifungal agents. 3,725,557, Cl. 424-251.000.

Douty, Donald L., to United States Steel Corporation. Can end with bonded seal slide. 3,724,728, Cl. 222-541.000.

Dover Corporation: *See*—
Sendoykas, Jack J.; and McPherson, Alexander W., 3,724,836.

Dover Corporation De-Sta-Co Division: *See*—
McPherson, Alexander W., 3,724,837.

Dow Chemical Company, The: *See*—
Adams, Jack J., 3,725,360.
Domenico, Penelope B., 3,725,421.
Hamilton, Charles E., 3,724,542.
Johnson, Francis; and Nasutavicus, Wilmonte A., 3,725,401.
McClendon, Jack C.; and Berry, Elton L., 3,725,387.
McKinley, Suzanne V.; and Rakshys, Joseph W., Jr., 3,725,365.
Moore, William Ross; and Langner, Ralph Rolland, 3,725,125.
Niles, Eart T.; and Stevens, Don L., 3,725,152.
Parrish, Donald B.; and Olstowski, Franciszek, 3,725,355.
Rogers, Morris Gwynne; and Tsai, James Hwa-San, 3,725,341.
Schulz, Gerald L.; and Caiola, Robert J., 3,725,109.
Smith, Harry A.; and Kobel, Erwin H., 3,725,349.
Spangenberg, Stanley F., 3,725,539.

Dow Corning Corporation: *See*—
Campbell, James K.; and Musolf, Martin C., 3,725,000.

Down, Bernard W.: *See*—
Wenrich, Carl M.; and Down, Bernard W., 3,725,637.

Drake, George L., Jr.: *See*—
Lanoux, Sigred B.; Ellzey, Samuel E., Jr.; Drake, George L., Jr.; and Reeves, Wilson A., 3,725,001.

Dranetz Engineering Laboratories Inc.: *See*—
Cox, Philip P., 3,725,781.

Draugelis, Vaidevutis C.; Hartman, William R., Jr.; Langdon, Michael J.; and McCarroll, Alan F., to Xerox Corporation. Color reproduction apparatus. 3,724,943, Cl. 355-4.000.

Dreeben, Jack. Throttle control apparatus. 3,724,287, Cl. 74-526.000.

Dreher, John L.: *See*—
Carter, Crawford F.; and Dreher, John L., 3,725,275.

Dresser Industries, Inc.: *See*—
Douglas, Bobby L., 3,724,486.

Dreyfoos, Alex W., Jr., to Photo Electronics Corporation. Logarithmic circuit with automatic compensation for variations in conditions of operations. 3,724,954, Cl. 356-175.000.

Drinkard, B. M.: *See*—
Allen, Paul T.; Drinkard, B. M.; and Unger, Edward H., 3,724,170.

Dryon, Jacques Max Charles, to Ateliers Heuze, Malevez et Simon Reunis Societe Anonyme. Apparatus for applying pressure to an advancing web of rigid material. 3,724,045, Cl. 29-90.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bigelow, John Howard, 3,725,078.
Bowen, Braxton C., 3,725,523.
Donohue, Paul Christopher, 3,725,310.
Fernandes, Harold; and Walsh, William Henry, 3,725,532.
Galli, Richard J., 3,724,068.
Gorton, Bert S., 3,725,124.
Schreyer, Ralph C., 3,725,343.
Weidman, Verne Wesley; and Yates, Paul C., 3,725,095.
West, Harry Bowman, 3,725,448.

Du Pont de Nemours, E. I., and Company, mesne: *See*—
Bride, John Edwin, 3,725,214.

Du Pont du Nemours, E. I., and Company: *See*—
Short, Oliver A.; and Weaver, Richard V., 3,725,035.

Duchane, David V., to Kimberly-Clark Corporation. Tampon coated with insertion aid and method for coating. 3,724,465, Cl. 128-285.000.

Ducommun Incorporated, mesne: *See*—
Rodgers, John T.; Williams, Richard M.; and Larsen, Richard J., 3,725,110.

Duesberg, Joe D., to United States of America, Air Force. Method of preventing the plugging of liquid coolant passages of a regeneratively cooled rocket engine thrust chamber. 3,724,048, Cl. 29-157.00c.

Duke, Buford W. Hydrostatic shock operated, fast closing valve and sabot. 3,724,320, Cl. 89-1.00r.

Dullabaun, Paul W.: *See*—
Price, William E.; and Dullabaun, Paul W., 3,724,811.

Dun-Rite Manufacturing Corporation: *See*—
Kliewer, George G.; Kliewer, Steven L.; and Kliewer, Michael G., 3,724,360.

Duncan, John; and Hart, Graham Arthur Nigel, to Husband's Shipyards Limited. Rotatable fenders. 3,724,413, Cl. 114-220.000.

Dunn, Wendell E., Inc.: *See*—
Dunn, Wendell E., Jr., 3,724,171.

Dunn, Wendell E., Jr., to Dunn, Wendell E., Inc. Annular flow condenser. 3,724,171, Cl. 55-71.000.

Duo-Flex Corporation: *See*—
Stanley, John Edwin, 3,725,568.

Durney, Lawrence J.: *See*—
Saubestre, Edward B.; and Durney, Lawrence J., 3,725,108.

Durr, Albert M., Jr.; and Meador, William R., to Continentah Oih Company. Mixtures of mono-n-alkylbenzenes and di-n-alkylbenzenes. 3,725,280, Cl. 252-59.000.

Dutt, Edward A.: *See*—
Harris, Garrett H.; Dutt, Edward A.; and Savage, Billy J., 3,724,790.

Dworschack, Roberg George: *See*—
White, William Harold; and Dworschack, Roberg George, 3,725,202.

Dynamics Corporation of America: *See*—
Emmons, Robert J., 3,725,624.

Dynamit Nobel Aktiengesellschaft: *See*—
Gawlick, Heinz; Marondel, Gunther; Sieglein, Werner; Wasser, Wolfgang; and Bendler, Hellmut, 3,724,381.
Rohde, Wilhelm; and Helfgen, Werner, 3,724,318.

Eadie Bros. & Company Limited: *See*—
Gillies, William MacArthur, 3,724,718.

Eads, Harold O., to McDonough Co. Leaf rake with improved molded head. 3,724,188, Cl. 56-400.170.

Eager, George S., Jr.: *See*—
Bahder, George; Garner, Oscar G.; and Eager, George S., Jr., 3,725,230.

Eakman, Clarence. Bathtub shower splash plate. 3,724,000, Cl. 4-148.000.

Earp, Charles William, to International Standard Electric Corporation. System for discrete marking and detecting a predetermined point in time within the envelope of a pulse modulated carrier. 3,725,786, Cl. 325-15.000.

Eastman Kodak Company: *See*—
Anderson, Albert E.; and Lum, Kin Kwong, 3,725,062.
Bailey, Joseph; Knott, Edward B.; and Marr, Peter A., 3,725,067.
Hamb, Frederick L.; and Wilson, John C., 3,725,070.
Hutchison, Miller R., Jr., 3,724,283.
Jacoby, Frederick J.; Hamb, Frederick L.; and Trent, Lewis C., 3,725,329.
Jenkins, Gerald L.; Jungjohann, Vernon H.; Marvin, Edgar S.; and Seely, Neil G., 3,724,937.
Lorenzini, Raymond; and Kinsella, Richard I., 3,724,162.
Martin, Wilhiam A.; and Saint Clair, John Q., II, 3,724,777.
Martin, William A., 3,724,858.
McKee, Edward S., 3,724,776.
Monks, David E., 3,724,348.
Reynolds, Jefferson W.; and Sloan, Cephas H., 3,724,469.
Rosborough, Robert S., Jr.; and Wright, Luther M., 3,725,168.
Seelbinder, David C., 3,724,951.
Seelbinder, David C.; and Ballard, Clinton S., 3,725,071.
Seil, Kenneth F.; and Worth, Joseph H., 3,725,639.
Webster, Frank G.; and Taber, Robert C., 3,725,398.
Wolfarth, Eugene F.; Smith, Donald A.; Farran, Charles F.; and Dappen, Glen M., 3,725,063.

Easton, Roger L., to United States of America, Navy. Intermittent CW system for satellite surveillance. 3,725,924, Cl. 343-10.000.

Eaton, Sargent Sheffield, Jr., to RCA Corporation. Phase shift oscillators using insulated-gate field-effect transistors. 3,725,822, Cl. 331-108.00b.

Ebling, Hilmer F., to Smith, A. O., Corporation. Method of making steel powder articles of select electrical resistivity. 3,725,521, Cl. 264-104.000.

Eckardt, J. C., AG: *See*—
Bader, Horst, 3,724,476.

Eckelman, William C.; and Richards, Powell, to United States of America, Atomic Energy Commission. Technetium labeling. 3,725,295, Cl. 252-301.10r.

Economy, James; and Matkovich, Vlado I., to Carborundum Company, The. Boron carbide fiber production. 3,725,533, Cl. 423-291.000.

Eder, Otto; and Hascic, Wladimir, to Semperit Aktiengesellschaft. Shoe and method of manufacturing same. 3,724,104, Cl. 36-14.000.

Edstrom, Gene H.; and Lutter, Edward P., to International Business Machines Corporation. Media transport performance measurements. 3,725,655, Cl. 235-151.320.

Edwards, Norman W.; Derr, Vincent H.; and Mattson, Richard A., to Pittsburgh-Des Moines Steel Company. Floating roof having uniformly distributed buoyancy means. 3,724,704, Cl. 220-26.00r.

Edwards, Raymond S.; and Guy, Thomas L. Planing apparatus. 3,724,517, Cl. 144-116.000.

Eggert, Walter S., Jr.: *See—*
Wessells, Henry W., III; and Eggert, Walter S., Jr., 3,724,153.

Ehrens, Henry; and Slocum, Charles W., to Thermo-Electronics, Inc. Starting circuit for permanent split capacitor motor. 3,725,757, Cl. 318-221.00c.

Ehrreich, John E.; and Reti, Adrian R., to Grahim Magnetics, Inc. Process for making small particles. 3,725,036, Cl. 75-.50a.

Eisenberg, Melvin I. Container with self-closing one-way valve. 3,724,461, Cl. 128-227.000.

Eisses, Reinhart Charles Willem: *See—*
De Gier, Johannes; and Eisses, Reinhart Charles Willem, 3,725,710.

Ekstrom, Stafan Walter, to AGA Aktiebolag. Breathing valve. 3,724,482, Cl. 137-102.000.

Elder Machinery and Tool Engineering Company: *See—*
Elder, Raymond H., 3,724,270.

Elder, Raymond H., to Elder Machinery and Tool Engineering Company. Flag arm retaining system. 3,724,270, Cl. 73-267.000.

Electrohome Limited: *See—*
Papay, Joseph, 3,725,800.

Electronic Engineering Co. of California: *See—*
Hager, George S.; Keech, Eugene E.; and Dossett, Lawrence S., 3,724,772.

Electronic Processors, Inc.: *See—*
Thompson, Kenneth C., 3,725,606.

Electronor Corporation: *See—*
de Nora, Vittorio; and Trisoglio, Giovanni, 3,725,223.

Ellerton, Norman V.; Paradise, William F.; and Sanford, Peter E., to Glaxo Laboratories Limited. Method of producing 7β-acylamido-3-methylceph-3-em-4-carboxylic acid ester. 3,725,399, Cl. 260-243.00c.

Elliott Brothers (London) Limited: *See—*
Colston, John Matthew; and Machin, James Robert, 3,725,723.
Nurmohamed, Amin Mulji; and Watters, Richard, 3,725,818.

Elliott, Jack G.: *See—*
Weidman, Joseph S.; Yee, Henry C.; Elliott, Jack G.; and Margosian, Zaven, 3,725,921.

Elliott, John Scotchford; Crail, Ian Robert Henry; and Jayne, Gerald John Joseph, to Castrol Limited. Reaction products of a polyalkylene amine sulfonic acid and an alkenyl succinc acid or anhydride. 3,725,434, Cl. 260-326.300.

Ellis, John D., Jr.: *See—*
Saccomano, Joseph M.; and Ellis, John D., Jr., 3,724,830.

Ellis, Peter H., to Rohr Industries, Inc. Drive mechanism. 3,724,759, Cl. 239-265.290.

Ellwanger, Hans; Kraisel, August; Kraus, Walter; and Zirps, Wilhelm, to Bosch, Robert, G.m.b.H. Hydraulic adjusting apparatus for hospital beds or the like. 3,724,003, Cl. 5-68.000.

Ellzey, Samuel E., Jr.: *See—*
Lanoux, Sigred B.; Ellzey, Samuel E., Jr.; Drake, George L., Jr.; and Reeves, Wilson A., 3,725,001.

Elson, Edward E.; McQuary, Kenneth L.; Karlin, George H.; and Lane, Bert, to Automatic Helium Balloon Systems Inc. Gas dispenser and inflation gauge. 3,724,516, Cl. 141-95.000.

Emerson Electric Co.: *See—*
Sugden, Harry, Jr., 3,724,808.

Eminger, Robert J., to Essex International, Inc. Apparatus for winding two pole dynamoelectric machine field coils. 3,724,515, Cl. 140-92.100.

Emmert, Reinhold: *See—*
Kuhnlein, Dieter; Emmert, Reinhold; and Haag, Georg, 3,724,778.

Emmons, Robert J., to Dynamics Corporation of America. Rotary switch beater ejector. 3,725,624, Cl. 200-157.000.

Eng, Kjell; and Salomonsson, Sven-Olof, to AB Sveriges Forenade Trikafabriker. V-Belt and method of forming same. 3,724,284, Cl. 74-234.000.

Engelhard Minerals and Chemicals Corporation: *See—*
Zentz, William E., Jr., 3,725,100.

Engineered Data Peripherals Corporation: *See—*
Garfein, Irwin B., 3,725,884.

Engler, Joseph P.; and Paulsen, Glen E., to T. O. Plastics, Inc. Plate dispenser. 3,724,719, Cl. 221-279.000.

English Clays Lovering Pochin & Company Limited: *See—*
Gwilliam, Ralph Derek, 3,724,663.

Enloe, Kenneth M., to Kimberly-Clark Corporation. Prefolded disposable diaper. 3,724,464, Cl. 128-284.000.

Enochian, Samuel H., to Unarco Industries, Inc. Interlocking device for inflatable bulkheads. 3,724,395, Cl. 105-369.0ba.

Ensign-Bickford Company, The: *See—*
Zilcosky, Hector Joseph, 3,724,382.

Enthone, Incorporated: *See—*
Saubestre, Edward B.; and Durney, Lawrence J., 3,725,108.

Envirco Corporation: *See—*
Benson, Harvey S., Jr., 3,724,181.

Environmental Industries, Inc.: *See—*
Morton, Bernard W.; and Morton, Willard E., 3,724,180.

Envopak Limited: *See—*
Adamson, Donald; and Arthur, Frank Henry, 3,724,890.

Epshtein, Yakov Vulfovich: *See—*
Kavepa, Alexandr Alexandrovich; Nitkovskikh, Anatoly Anatolievich; Grigoriev, Vladimir Andreevich; Pashkov, Arkady Borisovich; and Epshtein, Yakov Vulfovich, 3,725,013.

Epstein, Arthur: *See—*
Velten, Edmund M.; Jagaciak, George J.; Wambold, John N.; and Epstein, Arthur, 3,724,050.

Epstein, Peter F.: *See—*
Newallis, Peter E.; Poje, Albert J.; and Epstein, Peter F., 3,725,030.

Erdelyi, Alexander: *See—*
Capps, David B.; and Erdelyi, Alexander, 3,725,422.

Erdmenger, Rudolf; Ullrich, Martin; Germerdonk, Rolf; Pedain, Josef; Quiring, Bernd; and Wingler, Frank, to Bayer Aktiengesellschaft. Process for the production of crosslinkable powder lacquers. 3,725,340, Cl. 260-47.0ep.

Erickson, Albin R., to Textron, Inc. Front suspension for snowmobiles. 3,724,578, Cl. 180-5.00r.

Erickson, Harold E.: *See—*
Brookhyser, Byron B.; Erickson, Harold E.; and Perry, Glenn R., 3,725,183.

Erickson, John S.; Curran, Patrick M.; and Owczarski, William A., to United Aircraft Corporation. Mold for casting single crystal articles. 3,724,531, Cl. 164-361.000.

Erie Development Company: *See—*
Ahlquist, Harry Richard, 3,724,668.

Eriksson, Folke, to AB Cator & Celsius. Method of fractionating wood fiber pulp or the like and device for performing the method. 3,724,660, Cl. 209-250.000.

Eross, Bela, to Instrumentation Industries, Inc. Fractional inspiratory oxygen monitoring valve apparatus. 3,724,489, Cl. 137-322.000.

Erwin, Rudy, to Aerojet-General Corporation. Carbide-metal composites. 3,725,055, Cl. 75-134.00f.

Escher Eyss GmbH: *See—*
Dahl, Hans; and Kurz, Anton, 3,725,197.

Eschrich, Dieter: *See—*
Kral, Erwin F.; and Eschrich, Dieter, 3,725,007.

Eskimo Pie Corporation: *See—*
Jernigan, Thomas L., 3,724,984.

Essex International, Inc.: *See—*
Eminger, Robert J., 3,724,515.

Esso Production and Research Company: *See—*
Matthews, Jamie F., Jr., 3,724,224.

Esso Production Research Company: *See—*
Ruppel, James Harold, 3,724,475.

Esso Research and Engineering Company: *See—*
Coddington, David M.; Marsh, William D.; and Cohen, Harvey, 3,724,521.
Hamner, Glen P.; and Mason, Ralph B., 3,725,242.
Kramer, George M., 3,725,500.
Mancini, Paul A.; and May, Walter G., 3,724,225.
Reisch, John C., 3,725,534.
Wagensommer, Joseph; Lauria, Richard J.; and Staib, John H., 3,725,364.

Etablissement Microfilm Automatic Data Processing: *See—*
Warnez, Guy, 3,724,736.

Ethyl Corporation: *See—*
Berry, Currie B., Jr.; and Valdo, Alex R., 3,725,037.
Worrel, Calvin J., 3,725,277.

Eustance, John W., to General Electric Company. Method of making a capacitor with a preimpregnated dielectric. 3,724,043, Cl. 29-25.420.

Evans, James P. Mud flaps. 3,724,871, Cl. 280-154.50r.

Eversberg, Gerhard; and Seelbach, Heinz, to Reininghaus & Co., Firma. Illumination device. 3,725,695, Cl. 240-52.00r.

EVG Entwicklungs- und Verwertungsgesellschaft m.b.H: *See—*
Ritter, Josef; and Gott, Hans, 3,725,632.

Exceltronic Industries, Ltd.: *See—*
Wright, Kenneth F. A., 3,724,636.

F & E Manufacturing Company: *See—*
Burgess, Ronald R., 3,724,707.
Burgess, Ronald R., 3,724,708.

Fabian, Wolfgang; Franz, Joachim; and Polster, Rudolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Conversion of polyhalophthalocyanines into pigmentary form. 3,725,433, Cl. 260-314.500.

Fabio, Paul Frank: *See—*
Tomcufcik, Andrew Stephen; Izzo, Patrick Thomas; and Fabio, Paul Frank, 3,725,407.

Fabris, Hubert Jakob; Maxey, Edwin Morgan; and Schmucker, Arden Everett, to General Tire & Rubber Company, The. Temperature sta-

ble flexible isocyanate-terminated polymers and polyisocyanurate polymers therefrom. 3,725,357, Cl. 260-77.5nc.

Fackenthal, Harry, to General Motors Corporation. Fluid unit with dump and fill control. 3,724,209, Cl. 60-357.000.

Fadner, Glenn Roland, Jr., to RCA Corporation. Method for making a kinescope comprising a color selection mask with temporary corridors. 3,725,065, Cl. 96-36.100.

Faethe, Manfred: *See—*
Friedel, Christian; and Faethe, Manfred, 3,725,218.

Fagan, William F.: *See—*
Kobler, Richard; Fagan, William F.; and Feldman, Edward, 3,724,859.

Fahey, Denis; and Clarke, Reginald L., to Boulton, William, Limited. Vibro-gyratory mills. 3,724,146, Cl. 51-163.000.

Faiks, Frederick S.; and Buhk, Randall P., to Steelcase Inc. Wire rod chair. 3,724,897, Cl. 297-446.000.

Fairchild, Anthony Prince, to Synectron, Inc. Electronic alarm system. 3,725,865, Cl. 340-172.000.

Faltico, Frank J., to Allied Trading Co. Door knob burglar alarm. 3,725,892, Cl. 340-274.000.

Fanella, Robert J.; Marcinkus, Donald W.; and Sterly, Glenn E., to Ampex Corporation. Cassette playback and/or recording apparatus with loading ease feature. 3,724,779, Cl. 242-198.000.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Disselnkotter, Hans, 3,725,402.
Gehrke, Gunter; Hederich, Volker; Neeff, Rutger; and Wegner, Peter, 3,724,998.
Golitz, Hans Dietrich; Merten, Rudolf; Noll, Walter; and Simmler, Walter, 3,725,449.
Rodi, Fritz; and Hund, Franz, 3,725,281.
Wirth, Wolf-Dieter; Muller, Erwin; Blahak, Johannes; and Rohr, Harry, 3,725,321.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Boldt, Manfred; Arpe, Hans-Jurgen; and Hornig, Lothar, 3,725,462.
Hanschke, Ernst; Fester, Walter; and Jakob, Franz, 3,725,478.
Hunger, Klaus, 3,725,278.
Kleiner, Hans-Jerg, 3,725,227.
Konig, Wolfgang; and Geiger, Rolf, 3,725,380.
Kuch, Heinz; Schmitt, Karl; Seidl, Gunther; and Hoffmann, Irmgard, 3,725,404.
Kuhne, Rudolf; Hamal, Heinrich; and Thilenius, Thilo, 3,725,101.
Schimmelschmidtq Kurt; and Kleiner, Hans-Jerg, 3,725,515.
Stache, Ulrich; Fritsch, Werner; Haede, Werner; Radscheit, Kurt; and Lindner, Ernst, 3,725,393.
Voigt, Hartman; Schneck, Erich; Gunther, Klaus; and Noha, Klaus, 3,725,491.
Von Der Eltz, Hans-Ulrich; and Gross, Richard, 3,724,997.

Farmer, William M., to United States of America, Air Force. Method of forming and cooling pinhole spatial filter for high power laser. 3,724,930, Cl. 350-320.000.

Farran, Charles F.: *See—*
Wolfarth, Eugene F.; Smith, Donald A.; Farran, Charles F.; and Dappen, Glen M., 3,725,063.

Fasciati, Alfred: *See—*
Zickendraht, Christian; and Fasciati, Alfred, 3,725,384.

Fathauer, George H., to Masco Corporation, mesne. Signal-selecting radio receiver. 3,725,788, Cl. 325-469.000.

Featherston, John Richard, to International Business Machines Corporation. Exigent multisatellite digital radio communications system. 3,725,787, Cl. 325-58.000.

Featherstone, Arthur H. Combination seal cap and valve. 3,724,488, Cl. 137-223.000.

Fedders Corporation: *See—*
Laue, Terry J.; and Buck, Leo V., 3,724,095.

Federer, Fritz; and Neumann, Henning, to Metzeler Aktiengesellschaft. Storage system for gaseous fluids and the like. 3,724,497, Cl. 137-575.000.

Fegley, Richard F.: *See—*
Kiss, Emil P.; Onyx, Raymond C.; and Fegley, Richard F., 3,725,179.

Fekete, Frank; Pulman, Leonard J.; and Thrash, David J., to Koppers Company, Inc. Method for producing laminates. 3,725,172, Cl. 156-252.000.

Felcheck, Marvin; Kirschner, Wallace; Jarosik, Robert J.; and Capes, Charles W., to Pitney Bowes-Alpex, Inc. Parallel-access data file system. 3,725,870, Cl. 340-172.500.

Feldberg, Leonard H., to Burndy Corporation. Connector for integrated package. 3,725,842, Cl. 339-17.0cf.

Feldman, Edward: *See—*
Kobler, Richard; Fagan, William F.; and Feldman, Edward, 3,724,859.

Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung: *See—*
Opderbeck, Fritz; Ploetz, Theodor; and Wistuba, Herbert, 3,725,107.

Feller, Gilbert, to Metalem S.A. Ring member for a watch dial. 3,724,202, Cl. 58-127.00r.

Fellers, Paul J.: *See—*
Barron, Rodger W.; Fellers, Paul J.; and Huggart, Richard L., 3,725,083.

Fellowes Manufacturing Company: *See—*
Beck, Robert E., 3,724,920.

Fenity, Nancy: *See—*
Fenity, Robert D., 3,725,283.

Fenity, Robert D.; deceased (by Fenity, Nancy; executrix), to Xerox Corporation. Electrostatographic developer containing uncoated glass-ceramic carrier particles. 3,725,283, Cl. 252-62.100.

Ferino, Ferdinand. Cafly. 3,724,577, Cl. 180-1.0fv.

Fernald, Charles Henry; and Chick, Joseph James, to AMP Incorporated. Machine for feeding a continuous strip of electrical connectors. 3,724,054, Cl. 29-203.00d.

Fernandes, Harold; and Walsh, William Henry, to Du Pont de Nemours, E. I., and Company. Process for removing oxidizable fumes from heated air used to treat textile fibers. 3,725,532, Cl. 423-245.000.

Fernschild, Gunter: *See—*
Paucksch, Heinrich; Massonne, Joachim; Bohm, Horst; and Fernschild, Gunter, 3,725,475.

Ferro Corporation: *See—*
Hummel, Floyd A.; and Sarver, James F., Jr., 3,725,102.

Ferry, William R.: *See—*
Voss, James R.; and Ferry, William R., 3,724,433.

Fester, Walter: *See—*
Hanschke, Ernst; Fester, Walter; and Jakob, Franz, 3,725,478.

Fichter, Walter; Armbruster, Otto; and Assmus, Friedrich, to Gebruder Junghans G.m.b.H., Firma. Starting control device for running events. 3,724,843, Cl. 272-59.00a.

Fiedler, William S., to United States of America, Air Force. Disappearing-reappearing radar chaff and method for production. 3,725,927, Cl. 343-18.00r.

Field, Nathan D.; and Freyermuth, Harlan B., to GAF Corporation. Photosensitive propargyl polymer composition an method of using. 3,725,064, Cl. 96-35.100.

Fink, Robert W.; and Boyko, Eugene S., to Westinghouse Electric Corporation. Method of and apparatus for welding an end plug onto a nuclear fuel element. 3,725,635, Cl. 219-121.00p.

Finkel, Abraham M.; and Surwill, Michael, to Lockheed Aircraft Corporation. Apparatus for performing axially-and-radially located operations on tubular construction. 3,724,053, Cl. 29-200.00b.

Finley, Carl E., to Olin Corporation. Camp stove tray to case mount. 3,724,441, Cl. 126-38.000.

Finnegan, Ronald A., to Veeder Industries Inc. Optical encoder. 3,725,902, Cl. 340-347.00p.

Firestone Tire & Rubber Company, The: *See—*
Halasa, Adel F.; and Schroeder, Ervin E., 3,725,369.
Halasa, Adel F.; and Schroeder, Ervin E., 3,725,370.

Fischbein, Irwin W.; Alexander, Ben H.; and Sastri, Aiyaswami S., to Gillette Company, The. Razor blades. 3,725,238, Cl. 204-298.000.

Fischer & Porter Co.: *See—*
Levesque, Peter S., 3,725,762.

Fischer, Frederick K., to Westinghouse Electric Corporation. Moisture removal device for a steam turbine. 3,724,967, Cl. 415-168.000.

Fischer, Georg, Aktiengesellschaft: *See—*
Alt, Anton, 3,724,829.
Buhrer, Erwin, 3,724,659.

Fischer, William H.; and Cromer, Charles F., to Westinghouse Electric Corporation. Gas-blast downstream-type of high-voltage circuit breaker having field-controlling shields and single venting movable contact. 3,725,623, Cl. 200-148.00b.

Fisher, George, Aktiengesellschaft: *See—*
Szatmari, Franz; and Wernli, Max, 3,724,821.

Fisher, Robert C. Seat belt retractor. 3,724,773, Cl. 242-107.400.

Fisons Limited: *See—*
Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert, 3,725,554.

Fives Lille-Cail: *See—*
Retali, Roger; Mercier, Andre; and Billot, Claude, 3,724,238.

Fizmaurice, Richard W., to FMC Corporation. Boom irrigation system. 3,724,758, Cl. 239-251.000.

Fjuimoto, Keimei: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.

Flad, Karl. Knitting machine with device for jacquard patterning. 3,724,240, Cl. 66-50.00r.

Flanagan, Lindley E., Jr. Fishing jig having a flexible body. 3,724,117, Cl. 43-42.240.

Fleischer, Henry. Adjustable ladder and scaffold. 3,724,592, Cl. 182-27.000.

Fleischer, Herman J.; Lipsky, Philip; and Tiblin, Bert V., to Sperry Rand Corporation. Collision avoidance display apparatus for maneuverable craft. 3,725,918, Cl. 343-5.0em.

Fluor Corporation: *See—*
Wrisberg, Johannes; Andersen, Kjeld Jorn; and Mogensen, Erik, 3,725,495.

FMC Corporation: *See—*
Adams, William J., Jr., 3,724,580.
Cassady, Henry W., Jr.; and Stilwell, Robert E., 3,724,168.
Fizmaurice, Richard W., 3,724,758.
Hook, Corey T., 3,724,341.
Huniu, Sam, 3,724,499.
Joseph, Robert T., 3,725,018.
Joseph, Robert T.; and Work, Josiah, 3,725,034.
Reimers, James L., 3,724,644.
Zanpirri, Anthony P.; Trechock, Jack; and Joseph, Robert T., 3,725,019.

Foley, Charles F.; McCarthy, Charles D.; and Hardin, Charles H., to Kusan, Inc. Robot push toy. 3,724,124, Cl. 46-97.000.

Foley, Norman Leslie, to Auscoteng Pty. Ltd. Desalination plant. 3,725,206, Cl. 202-205.000.

Fonden, Per Borje; and Walander, Kar Ove Torgny, to Borgs Fabriks AB. Operating system for aircraft barrier nets. 3,724,333, Cl. 91-411.00r.

Fonden, Per Borje; and Walander, Karl Ove T., to Borgs Fabriks AB. Line or band for arresting aircraft. 3,724,787, Cl. 244-110.00a.

Forbes, Hampton E., Jr., to Westvaco Corporation. Multi-product carton. 3,724,650, Cl. 206-45.190.

Ford, John A. Flexible connector. 3,724,878, Cl. 285-93.000.

Ford Motor Company: *See—*
Allison, William D., 3,724,869.
Dehar, David C., 3,724,882.
Kavthekar, Keshav S.; and Somers, Jess J., 3,724,357.
Kitzner, Ernest W.; Rhodes, Alex; and Rose, James, 3,724,286.
Thorn, John E.; and Selman, Alan A., 3,724,571.

Forel, Sheldon H.: *See—*
Johnson, Stanley R.; and Forel, Sheldon H., 3,725,004.

Formeister, Richard B.: *See—*
Black, Stanley H.; and Formeister, Richard B., 3,725,938.

Forsberg, Albert G. Self adjusting window trim. 3,724,136, Cl. 49-505.000.

Fortin, Roger: *See—*
Beaulieu, Alexandre J.; Fortin, Roger; Johnson, Derwyn C.; and Robinson, Alexander, 3,725,735.

Foster Wheeler Corporation: *See—*
Reale, Salvatore J., 3,724,809.
Zoschak, Robert J., 3,724,267.

Foster Wheeler John Brown Boilers Limited: *See—*
Bell, Alan, 3,724,212.

Foundation Research Institute of Electric and Magnetic Alloys, The: *See—*
Masumoto, Hakaru; Sawaya, Shohachi; and Kikuchi, Michio, 3,725,052.
Masumoto, Hakaru; Sawaya, Shohachi; and Michio, Kikuchi, 3,725,053.

Fournier, Albert Anthony, to Johnson & Johnson. Thermally stable pressure-sensitive adhesive tape with polypropylene backing. 3,725,121, Cl. 117-122.0pf.

Fraik, Robert D., to Minnesota Mining and Manufacturing Company. Method of providing and developing hidden entries. 3,725,104, Cl. 117-1.700.

Fram Corporation: *See—*
Gernhardt, John William, 3,724,670.

Francini, Joseph P.; and Verdone, Michael A., to Singer Company, The. Twin disc pack. 3,724,652, Cl. 206-62.00p.

Francois, Paul: *See—*
Bertin, Jean Henri; and Francois, Paul, 3,724,588.

Franklin, Ivey: *See—*
Pierce, Louis D., 3,724,849.

Frantzen, Karl H., to Northern Natural Gas Company. Forced-draft furnace system. 3,724,403, Cl. 110-72.00r.

Franz, Joachim: *See—*
Fabian, Wolfgang; Franz, Joachim; and Polster, Rudolf, 3,725,433.

Fraze, Ermal C., mesne: *See—*
Brown, Omar L.; and Smyth, George F., 3,724,063.

Freda, John F. Bearing lubricator. 3,724,596, Cl. 184-1.00d.

Frederick, William N. Flexible chain for personal wear. 3,724,204, Cl. 59-80.000.

Frederiksen, Thomas M.; and Russell, Ronald W., to Motorola, Inc. Switching circuit with hysteresis. 3,725,673, Cl. 307-235.00r.

Frederiksen, Thomas M., to Motorola, Inc. Stabilized multivibrator circuit. 3,725,681, Cl. 307-273.000.

Freed, Meier E.: *See—*
Potoski, John R.; and Freed, Meier E., 3,725,410.

Freiberg, Leslie Alan, to Abbott Laboratories. Process for the demethylation of 3-amino macrolides. 3,725,385, Cl. 260-210.0ab.

Freimanis, Laimons, to Bell Telephone Laboratories, Incorporated. Balanced semiconductor switching network circuit and construction. 3,725,863, Cl. 340-166.00r.

Freimark, Ronald J.: *See—*
Gunderson, Philip D.; and Freimark, Ronald J., 3,725,583.

Freitag, Herbert; and Westerteiger, Wilhelm, to Stabilus Industrie und Handelsgesellschaft mbH. Resilient seat. 3,724,797, Cl. 248-400.000.

Fresard, Marcel; and Gabriel, Jean-Pierre, to Mefina S.A. Presser foot for a sewing machine. 3,724,406, Cl. 112-235.000.

Freshour, Kenneth D.; and van Dyk, John C. Fluid discharge system. 3,724,762, Cl. 239-427.300.

Fretague, William J.: *See—*
Mayo, Kenneth E.; and Fretague, William J., 3,725,663.

Freyermuth, Harlan B.: *See—*
Field, Nathan D.; and Freyermuth, Harlan B., 3,725,064.

Friberg, Jean-Marie; Maginot, Pierre; and Merigoux, Jean-Marie, to Compagnie Industrielle des Telecommunications CIT-ALCATEL. Axial supersonic compressor. 3,724,968, Cl. 415-181.000.

Frick, Hans-Dieter: *See—*
Busch, Josef; Bruck, Herbert; Schranz, Karl-Wilhelm; Schon, Erwin; and Frick, Hans-Dieter, 3,724,355.

Friedel, Christian; and Faethe, Manfred, to Veb Elektrogeratewerk Suhl. Process for pretreating decarbonized steel to be directly enamelled. 3,725,218, Cl. 204-34.000.

Friedline, Leslie E.; Stevenson, Thomas E.; and Weber, Lee A., to Bailey Meter Company. Pneumatic instrument servomechanism. 3,725,949, Cl. 346-72.000.

Friedman, Mendel, to United States of America, Agriculture. Removal of mercury from liquids using keratin derivatives. 3,725,261, Cl. 210-38.000.

Friedrich Deckel Aktiengesellschaft: *See—*
Bschorer, Konrad, 3,724,975.

Frigo, Richard J.; and Crowden, William F. Drum. 3,724,313, Cl. 84-452.00p.

Frisch, Kurt C., to Owens-Corning Fiberglass Corporation. Low smoke generating plastic compositions. 3,725,319, Cl. 260-2.5aw.

Fritsch, Werner: *See—*
Stache, Ulrich; Fritsch, Werner; Haede, Werner; Radscheit, Kurt; and Lindner, Ernst, 3,725,393.

Fry, Lloyd A., Roofing Company: *See—*
Fry, Lloyd A., Sr., 3,724,173.

Fry, Lloyd A., Sr., to Fry, Lloyd A., Roofing Company. Pollution control process. 3,724,173, Cl. 55-89.000.

Fuchs, Francis Joseph, Jr., to Western Electric Company, Incorporated. Collapsible feed mechanism. 3,724,336, Cl. 92-166.000.

Fuchs, Friedrich: *See—*
Petersen, Harro; Fuchs, Friedrich; and Ruemens, Wilhelm, 3,725,272.

Fuhrmann, Robert; and Van Peppen, Jan F., to Allied Chemical Corporation. Hydrogenation of alkenes employing an organometallic hydrogenation catalyst. 3,725,489, Cl. 260-666.00p.

Fuji Photo Film Co., Ltd.: *See—*
Masaaki, Taimoto; and Satoru, Honjo, 3,725,060.
Shiba, Keisuke; Hinata, Masanao; Yamasue, Koutaro; and Kondo, Tokiharu, 3,725,074.
Yoshida, Makoto; Tsuda, Momotoshi; Oishi, Yasushi; and Nakazyo, Kiyoshi, 3,725,072.

Fujii, Chiyuki: *See—*
Horiie, Shigeki; Morikawa, Hiroyasu; Fujii, Chiyuki; Kobayashi, Teruo; Kohno, Susumu; and Ono, Toru, 3,725,443.

Fujii, Jun: *See—*
Maezawa, Shiro; Yoshikawa, Hiroshi; Sakamoto, Kenji; Fujii, Jun; and Hashimoto, Makoto, 3,725,208.

Fujima, Yoshito: *See—*
Nagoya, Tsutomu; Fujima, Yoshito; and Shimizu, Yoichi, 3,725,437.

Fujimoto, Keimei: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.

Fujimoto, Yasuo; Masumura, Isao; Tatsukawa, Keizo; Koshimoto, Shinsuke; and Doiuchi, Toru, to Kyowa Hakko Kogyo Co., Ltd. Amino acid-urethane polymer compositions. 3,725,353, Cl. 260-75.0nk.

Fujiwara, Katsuji. Disc-type steam trap. 3,724,751, Cl. 236-59.000.

Fukudi, Hideo: *See—*
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Yamazaki, Osami; and Fukudi, Hideo, 3,725,474.

Fukuma, Yoshitakaka, to Sharp Kabushiki Kaisha. Computing system for use in price indicating balance. 3,725,656, Cl. 235-151.330.

Fullager, Harry, to Rosemount Engineering Company Limited. Platinum resistance temperature sensors. 3,725,837, Cl. 338-28.000.

Fuller Company: *See—*
Kramer, Walter W., 3,724,490.

Fulton, Theodore Alan, to Bell Telephone Laboratories, Incorporated. Supercurrent devices with enhanced self-field effects. 3,725,819, Cl. 331-107.00s.

Furuhashi, Tokio, to Nippon Electric Company, Limited. Transistor circuit of compound connection. 3,725,754, Cl. 317-235.000.

Furusaki, Shinichi: *See—*
Yamada, Keisho; Nishimura, Kenji; Furusaki, Shinichi; Toshimitsu, Tatsuo; and Inaba, Yukio, 3,725,459.

Gabriel, Jean-Pierre: *See—*
Fresard, Marcel; and Gabriel, Jean-Pierre, 3,724,406.

Gach, Peter P., to Sunbeam Plastics Corporation. Tamperproof and childproof overcap for an aerosol can. 3,724,724, Cl. 222-153.000.

Gaeth, Rudolf H., to Phillips Petroleum Company. Catalyst composition and process of polymerizing ethylene with same. 3,725,379, Cl. 260-94.90e.

GAF Corporation: *See—*
Field, Nathan D.; and Freyermuth, Harlan B., 3,725,064.
Mackey, E. Scudder, 3,725,079.
Mackey, E. Scudder, 3,725,080.

Gaffney, Bernard J., to Conwed Corporation. Method for producing a tubular net product. 3,725,518, Cl. 264-24.000.

Gagliardi, Nicholas, to Cycle-Dyne, Inc. Inductive coil for heating a loop of conductive material. 3,725,630, Cl. 219-10.790.

Gainesville Machine Company, Inc.: *See—*
Harben, Grover S., Jr., 3,724,032.
Lewis, Ernest E., 3,724,029.

Gallaghan, John A.; Benson, Ronald W.; and Carlson, Bertil V., to United States of America, Navy, mesne. Laser stimulated ordnance initiation device. 3,724,383, Cl. 102-70.20a.

Galli, Richard J., to Du Pont de Nemours, E. I., and Company. Semiconductor chip packaging apparatus and method. 3,724,068, Cl. 29-626.000.

Gancy, Alan Brian: *See—*

Poncha, Rustom Pestonji; Garofano, Norman Rutledge; and Gancy, Alan Brian, 3,725,014.
Ganssen, Alexander: *See—*
Webster, Jonathan C.; Sloan, Earl L., III; and Ganssen, Alexander, 3,725,798.
Garavelli, Giancarlo, to Heron Establishment. Ice cream making machine. 3,724,234, Cl. 62-308.000.
Garbalizer Corporation of America: *See—*
Brewer, John C., 3,725,538.
Garbini, Leo J.: *See—*
Seldon, Martin M.; and Garbini, Leo J., 3,725,719.
Gardner, Leonard R.: *See—*
Malmer, Michael M., Jr.; Perkins, Cornelius C.; Waldenmayer, Donald W.; Chowning, Patrick J.; and Gardner, Leonard R., 3,725,868.
Garfein, Irwin B., to Engineered Data Peripherals Corporation. Flying head support with damping means. 3,725,884, Cl. 340-174.10e.
Garner, Oscar G.: *See—*
Bahder, George; Garner, Oscar G.; and Eager, George S., Jr., 3,725,230.
Garofano, Norman Rutledge: *See—*
Poncha, Rustom Pestonji; Garofano, Norman Rutledge; and Gancy, Alan Brian, 3,725,014.
Garrett, John Mansell, to Westinghouse Brake and Signal Company Limited. Semiconductor device. 3,725,752, Cl. 317-235.00r.
Garrett, John Mansell, to Westinghouse Brake English Electric Semi-Conductors Limited. Inverse gate semiconductor controlled rectifier. 3,725,753, Cl. 317-235.00r.
Gasafi, Anton: *See—*
Nixon, Charles Roy; and Gasafi, Anton, 3,724,904.
Gasser, Richard E. Self-oscillating helium magnetometer. 3,725,775, Cl. 324-.50r.
Gast, Uwe, to Hell, Rudolf, Dr.-Ing., GmbH. Method and apparatus for recording rastered continuous-tone pictures in printed graphics. 3,725,574, Cl. 178-6.70r.
Gaster, Ivan: *See—*
Kleykamp, Donald L.; Gaster, Ivan; Browning, Vernon D.; and Holden, Homer N., 3,724,507.
Kleykamp, Donald L.; Gaster, Ivan; Browning, Vernon D.; and Holden, Homer N., 3,725,178.
Gates Rubber Company, The: *See—*
Douros, John D., Jr.; and Kerst, Al Fred, 3,725,557.
Gatti, Arnold P.: *See—*
Gurney, Chester T.; and Gatti, Arnold P., 3,724,442.
Gaus, Hermann, to Daimler-Benz Aktiengesellschaft. Regulating installation of a hydraulic control system, especially in vehicle transmissions. 3,724,294, Cl. 74-863.000.
Gauthier, William Kohlmann. Retractor apparatus. 3,724,449, Cl. 128-20.000.
Gauzza, Harry J.; and Horanoff, Eugene V., to United States of America, Navy. Deployable aerodynamic ring stabilizer. 3,724,782, Cl. 244-3.270.
Gawlick, Heinz; Marondel, Gunther; Sieglein, Werner; Wasser, Wolfgang; and Bendler, Hellmut, to Dynamit Nobel Aktiengesellschaft. Tear gas element. 3,724,381, Cl. 102-65.000.
Gay, Pierre, to Creusot-Loire Entreprises. System for driving or braking a strip. 3,724,735, Cl. 226-95.000.
Gaylord, Norman G., to Champion International Corporation. Thermoplastic polymer film-polyhydric polymer film laminate. 3,725,174, Cl. 156-305.000.
Gebruder Junghans G.m.b.H., Firma: *See—*
Fichter, Walter; Armbruster, Otto; and Assmus, Friedrich, 3,724,843.
Gehl Company: *See—*
Burrough, Donald E.; Scheffler, David R.; and Seefeld, Dean E., 3,724,908.
Leverenz, John H., 3,724,139.
Gehrke, Gunter; Hederich, Volker; Neeff, Rutger; and Wegner, Peter, to Farbenfabriken Bayer Aktiengesellschaft. Continuous dyeing of polyester fibers with water immiscible organic solvents and hydroxyphenyl amino anthraquinones. 3,724,998, Cl. 8-39.000.
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert, to Chemiebau, Dr. A. Zieren, G.m.b.H. & Co., K.G. Continuous distillation of phthalic anhydride with vapor side stream recovery. 3,725,211, Cl. 203-74.000.
Geiger, Rolf: *See—*
Konig, Wolfgang; and Geiger, Rolf, 3,725,380.
Geigy Chemical Corporation: *See—*
Brechbuhler, Hans Ulrich; and Gubler, Kurt, 3,725,418.
Geisler, Edwin A. Photocell controlled shopping cart package detector. 3,725,894, Cl. 340-280.00r.
Gelbard, Robert B., to General Electric Company. Refrigerator evaporator. 3,724,236, Cl. 62-419.000.
Gelblum, P. Gideon, to United States of America, Interior. Softening of sea water by addition of barium carbonite and carbon dioxide CO_2. 3,725,267, Cl. 210-48.000.
Gelblum, P. Gideon, to United States of America, Interior. Softening of sea water by addition of barium carbonate and mineral acid. 3,725,268, Cl. 210-53.000.
Gelder, Franz. Method and arrangement for optically representing industrial management data. 3,725,650, Cl. 235-151.300.
Gelzer, Justus Melchior: *See—*
Konopka, Edward Alexander; and Gelzer, Justus Melchior, 3,725,543.
General Cable Corporation: *See—*
Bahder, George; Garner, Oscar G.; and Eager, George S., Jr., 3,725,230.
Robinson, Daniel E.; and Rubinstein, Solomon, 3,725,841.
General Electric Company: *See—*
Anderson, Robert M.; Hanson, James M.; Lecrone, Richard C.; and Landgraf, William B., 3,725,693.
Bailey, Ronald B., 3,725,770.
Bell, Christy W.; and Titus, Charles H., 3,724,543.
Boyles, Robert L.; and Polonsky, Samuel, 3,725,615.
Boyles, Robert L.; and Polonsky, Samuel, 3,725,617.
Davidson, William E., 3,725,848.
De Puy, Robert P., 3,725,769.
Dooley, Eddie W., 3,724,889.
Eustance, John W., 3,724,043.
Gelbard, Robert B., 3,724,236.
Gillooly, George R., 3,725,297.
Haefner, Kenneth Browning; and Ringwall, Carl Gustav, 3,724,478.
Kunz, Raymond W., 3,725,640.
Kydd, Paul H.; and Jernakoff, George, 3,724,261.
Leonard, Stephen C.; and Dilick, Maurice D., 3,725,778.
Lukens, Alan Franck, 3,725,706.
Pollard, Ernest M., 3,725,742.
Rexford, Donald L., 3,724,477.
Ryon, David M., 3,724,673.
Schupp, Lewis J., 3,724,990.
Schupp, Lewis J., 3,724,991.
Tarshis, Lemuel A.; and Walker, James L., 3,725,057.
Traver, Frank J., 3,725,287.
van der Grinten, Willem J., 3,724,175.
General Foods Corporation: *See—*
Giacone, Joseph; and Schulman, Marvin, 3,725,082.
Stefanucci, Arthur; Harnisch, Douglas R.; Coogan, Joseph E., III; and Scarsella, Edward L., 3,725,076.
General Housewares Corporation: *See—*
Thyberg, Paul D.; and Splettstoeszer, Wallace G., 3,724,402.
General Instrument Corporation: *See—*
Baxter, Brent, 3,724,536.
General Mills Chemicals, Inc.: *See—*
Coury, Arthur J.; and Rogier, Edgar R., 3,725,450.
General Motors Corporation: *See—*
Barbulesco, Daniel J.; and Briar, John R., 3,724,622.
Borman, August H., 3,724,292.
Campbell, Lewis B.; and Pietrzak, Joe P., 3,724,804.
Cole, Edward N., 3,724,218.
Corry, Thomas M., 3,725,767.
Craig, Gale M., 3,725,698.
Fackenthal, Harry, 3,724,209.
Guetersloh, Donald G., 3,724,972.
Hart, Jack P., 3,724,533.
Harvey, Douglas J., 3,725,144.
Heidacker, Walter C., 3,724,599.
Heidorn, John H., 3,724,621.
Johnson, Douglas, 3,724,207.
Keil, Ronald B., 3,725,877.
Naismith, Thomas D.; and Shellhause, Ronald L., 3,724,605.
Pugh, Cecil C.; Wark, Emerson L.; and Rumpf, Richard O., 3,724,233.
Stromer, Joseph R., 3,724,615.
Welch, Earl S.; and Petelka, Roland J., 3,724,208.
General Signal Corporation: *See—*
Silva, John R., 3,725,680.
General Tire & Rubber Company, The: *See—*
Fabris, Hubert Jakob; Maxey, Edwin Morgan; and Schmucker, Arden Everett, 3,725,357.
Hofelt, Clarence, Jr.; and Corl, John E., 3,724,137.
Hofelt, Clarence, Jr., 3,725,163.
Uelzmann, Heinz; and Hidinger, David C., Jr., 3,725,460.
Gentili, Renato. Method of the continuous production of hydrofluoric acid. 3,725,536, Cl. 423-485.000.
Genzer, Jerome; and Conrad, George, to Warner-Lambert Company. Process for the production of ethyl 8-hydroxy-1 3-dioxolo(4,5G)-quinoline-7-carboxylate. 3,725,413, Cl. 260-287.00r.
George, Daniel J.; and Patterson, William C., to Aluminum Company of America. Cooking utensil assembly. 3,724,711, Cl. 220-63.00r.
George, William L., to Motorola, Inc. Process for making a fine geometry, self-aligned device structure. 3,725,150, Cl. 148-187.000.
Georgia Tech Research Institute: *See—*
Bates, Homer J., 3,724,690.
Carstens, Marion R.; and Bates, Homer J., 3,724,691.
Georgia-Pacific Corporation: *See—*
Blackmore, Kenneth A. E., 3,725,029.
Gerard, William L.; and Pregont, Jack E., to Sherwood Medical Industries, Inc. Cup tray and container. 3,724,654, Cl. 206-72.000.
Gerber, Heinz Joseph, to Gerber Scientific Instrument Company, The. Apparatus for selectively exposing a photosensitive surface. 3,724,347, Cl. 95-12.000.
Gerber Products Company: *See—*
Nelson, Lloyd A., 3,724,686.
Gerber Scientific Instrument Company, The: *See—*
Gerber, Heinz Joseph, 3,724,347.
Gerd, Rossmy: *See—*
Koerner, Gotz; Kropac, Vaclav; and Gerd, Rossmy, 3,725,339.
Gergely, William, Jr.: *See—*

Murthy, Nanjundiah Narasimha; Macura, Joseph Steven; Gergely, William, Jr.; and Berg, Allen Charles, 3,724,366.

Gerhardt, Gerard Ernest, to American Cyanamid Company. Single and double energy transfer in triplet photochromic compositions. 3,725,292, Cl. 252-300.000.

Gerity-Schultz Corporation: *See*—
Huffman, Richard D., 3,724,831.

Germerdonk, Rolf: *See*—
Erdmenger, Rudolf; Ullrich, Martin; Germerdonk, Rolf; Pedain, Josef; Quiring, Bernd; and Wingler, Frank, 3,725,340.

Gernandt, Louis E., to Armour and Company. Producing molded meat sticks. 3,724,026, Cl. 17-1.000.

Gernhardt, John William, to Fram Corporation. Separating fluids. 3,724,670, Cl. 210-448.000.

Gerth, Bruce F.: *See*—
Sollami, Blase J.; Lundeen, Howard R.; and Gerth, Bruce F., 3,724,228.

Gery, Herbert C.; and Samson, Marvin S., to Medical Electroscience and Pharmaceuticals, Inc. Printing mechanism for printing on flat or contoured surfaces. 3,724,369, Cl. 101-327.000.

Gessner, Richard W.; and Davies, Roy E., to Massillon Measurements, Inc. Expendable immersion thermocouple unit. 3,725,134, Cl. 136-234.000.

Ghielmetti AG: *See*—
Kirchdorf, Josef, 3,725,621.

Giacone, Joseph; and Schulman, Marvin, to General Foods Corporation. Centrifugal coffee roasting. 3,725,082, Cl. 99-68.000.

Giammarco, Giuseppe: *See*—
Giammarco, Guiseppe; and Giammarco, Paolo, 3,725,529.

Giammarco, Guiseppe; and Giammarco, Paolo, 1/2 to Vetrocoke Cokapuania S.p.A., mesne and 1/2 to said Giammarco, Giuseppe. Process for eliminating CO_2 and/or H_2S from gaseous mixtures. 3,725,529, Cl. 423-223.000.

Giammarco, Paolo: *See*—
Giammarco, Guiseppe; and Giammarco, Paolo, 3,725,529.

Giannotti Associates: *See*—
Giannotti, Hugo V., 3,725,271.

Giannotti, Hugo V., to Giannotti Associates. Apparatus and method for separating particles from a flow of fluid. 3,725,271, Cl. 210-65.000.

Gibson, David K.; and Johnson, Frederick W., to International Business Machines Corporation. Photoconductor discharge shutter assembly. 3,724,942, Cl. 355-3.000.

Gibson, Inc.: *See*—
Paul, Les, 3,725,561.

Gidge, Lester, to Monsanto Company. Non-tear seams produced by radio frequency means. 3,725,189, Cl. 161-146.000.

Gillberg, Carl Edward, to Johns-Manville Corporation. Machine for grooving brake blocks. 3,724,327, Cl. 90-11.00c.

Gillemot, George W.: *See*—
Thompson, John T.; and Gillemot, George W., 3,725,580.

Gillemot, George W.; and Thompson, John T. Re-enterable cable splice assembly and method including provision for addding branchout service cables as needed. 3,725,581, Cl. 174-38.000.

Gillespie, Richard L., Sr., to Wham-O Mfg. Co. Flying saucer. 3,724,122, Cl. 46-74.000.

Gillette Company, The: *See*—
Dorion, Francis W., Jr., 3,724,070.
Fischbein, Irwin W.; Alexander, Ben H.; and Sastri, Aiyaswami S., 3,725,238.

Gillies, William MacArthur, to Eadie Bros. & Company Limited. Devices for holding travellers for use on rings of ring spinning, twisting doubling and like frames. 3,724,718, Cl. 221-267.000.

Gillooly, George R., to General Electric Company. Halophosphate phosphor treatment process. 3,725,297, Cl. 252-301.40p.

Gilmore, Jerry L.: *See*—
Lemberger, Robert A.; and Gilmore, Jerry L., 3,724,664.

Gilmore, Thomas P., to Allis-Chalmers Corporation. Static control for step voltage regulator. 3,725,771, Cl. 323-20.000.

Gimenez, German Artigas, to Saint-Gobain. Method for homogenization of molten glass and additives. 3,725,025, Cl. 65-134.

Giorgi, Jean Claude: *See*—
Retali, Roger; Dambrine, Francis; Giorgi, Jean Claude; and Windal, Georges, 3,725,127.

Giotti, Alberto; and Sicuteri, Federigo. Method for activating the blood fibrinolysis by administration of 2-amino-ethanesulphonic acid or salts thereof. 3,725,553, Cl. 424-315.000.

Girdler-Sudchemie Katalysator G.m.b.H.: *See*—
Schneider, Michael, 3,725,047.

Giroux, Pierre R. Foldable tent camping unit. 3,724,893, Cl. 296-23.00r.

Gisler, Hans: *See*—
Boschung, Marcel; and Gisler, Hans, 3,724,557.

Glamb, Helen D.; widow: *See*—
Glamb, Stanley L., 3,724,873.

Glamb, Robert V.: *See*—
Glamb, Stanley L., 3,724,873.

Glamb, Stanley L.; deceased (by Glamb, Robert V.; administrator), to Glamb, Helen D.; widow. Three-wheeled vehicle. 3,724,873, Cl. 280-203.000.

Glass Containers ONTAINERS Corporation, mesne: *See*—
Strauss, Leo; and Sobran, Michael J., 3,724,637.

Glass, Marvin I.; and Breslow, Jeffrey D. Opposing pulling action game. 3,724,848, Cl. 273-1.00r.

Glaxo Laboratories Limited: *See*—
Ellerton, Norman V.; Paradise, William F.; and Sanford, Peter E., 3,725,399.
Graham, William; and Wetherill, Lewis A., 3,725,397.

Glosek, John J., to Western Electric Company, Incorporated. Logic circuitry for monitoring the cyclic operations of a pair of devices. 3,725,889, Cl. 340-259.000.

Gnoth, Bernhard, to Licentia Patent-Verwaltungs-G.m.b.H. Device for temporarily holding articles of different sizes. 3,724,835, Cl. 269-21.000.

Gobatti, Edmond F. Diagonally oscillating concentrator. 3,724,661, Cl. 209-437.000.

Godo, Takanobu: *See*—
Suzuki, Seiya; Mizuhata, Yasuo; Kinoshita, Kunihiko; and Godo, Takanobu, 3,725,391.

Goebel, Fred M., to LeBlond, Inc. Positioning apparatus. 3,724,291, Cl. 74-815.000.

Goggins, William B., Jr.: *See*—
Sletten, Carlyle J.; Schell, Allan C.; Mack, Richard B.; Goggins, William B., Jr.; and Blacksmith, Philipp, 3,725,917.

Gold, Alberto Vargas: *See*—
Streich, Federico; Gold, Alberto Vargas; Oliversas, Jose Ma Bonastre; and Ventura, Fernando Fernandez, 3,724,311.

Golden, Michael E. Remote-control system for intelligence-recording apparatus with control tone eliminating switching. 3,725,589, Cl. 179-6.00e.

Golden, Richard L., to Halcon International, Inc. Distillation of a haloalkyl-cyanide with a nitrile. 3,725,207, Cl. 203-6.000.

Golden, William Donald. Waterbed bedstead. 3,724,008, Cl. 5-348.0wb.

Goldfarb, Adolph E.: *See*—
Goldfarb, Adolph E.; and Ayala, Carl (said Ayala assor. to said), 3,724,125.

Goldfarb, Adolph E.; and Ayala, Carl, said Ayala assor. to said Goldfarb, Adolph E. Push button doll. 3,724,125, Cl. 46-119.000.

Goldfarb, Adolph E. Gear molding device. 3,724,803, Cl. 249-102.000.

Goldsby, Arthur R., to Texaco Inc. Alkylation of secondary olefins derived from hydrocarbon compositions containing tertiary olefins. 3,725,499, Cl. 260-683.620.

Goldschmidt, Th., AG: *See*—
Koerner, Gotz; Kropac, Vaclav; and Gerd, Rossmy, 3,725,339.

Golitz, Hans Dietrich; Merten, Rudolf; Noll, Walter; and Simmler, Walter, to Farbenfabriken Bayer Aktiengesellschaft. Cyclic urea derivatives and process for their manufacture. 3,725,449, Cl. 260-448.80r.

Gomes, John M.; Uchida, Kenji; and Wong, Morton M. United States of America, Interior Recovery of niobium and tantalum. 3,725,221, Cl. 204-61.000.

Gomez, Eloy A.; Goodsir, Stephen W.; and Marrocco, Dominic A., to American Home Products Corporation. Disposable cartridge for admixing two components of injectable medicament. 3,724,460, Cl. 128-218.00m.

Goodacre, Cecil, to Lansing Bagnall Limited. Pedestrian operated industrial truck. 3,724,586, Cl. 180-91.000.

Gooderum, Leoda J. Channel insert attachment for a zipper foot. 3,724,408, Cl. 112-240.000.

Goodrich, B. F., Company, The: *See*—
Le Blanc, Walter J.; and Rohrlack, Friedrich K. W., 3,724,624.
Makinen, Winnifred B.; and Srail, Raymond C., 3,724,107.
Rohrlack, Friedrich K. W.; and Main, Ralph R., 3,724,625.
Solomon, Thomas S., 3,725,326.
Thrower, Arthur J.; and Hotchkiss, Marvin E., 3,724,623.

Goodsir, Stephen W.: *See*—
Gomez, Eloy A.; Goodsir, Stephen W.; and Marrocco, Dominic A., 3,724,460.

Goodyear Tire & Rubber Company, The: *See*—
Bermingham, Peter D., 3,724,613.
Ruof, Edgar J., 3,724,902.
Suter, Charles A., 3,725,120.

Gorton, Bert S., to Du Pont de Nemours, E. I., and Company. Polymeric film coated with vinyl acetate/ethylene copolymer adhesive. 3,725,124, Cl. 117-138.8va.

Gosney, William Milton: *See*—
Carbajal, Bernard G., III; Gosney, William Milton; and Hall, Lou H., 3,724,065.

Goswami, Jagadish C.; and Jin, Jung, II, to Stauffer Chemical Company. Fire retardant resin compositions of post chlorinated vinyl halide-bis(hydrocarbyl) vinyl phosphonate copolymers. 3,725,359, Cl. 260-78.5bb.

Goto, Hideyuki, to Omron Tateisi Electronics Co. Article dispensing which arranges articles so that several may be viewed at one time for simultaneous approval of the operation. 3,724,717, Cl. 221-155.000.

Goto, Kenijiro, to Mansei Kogyo Kabushiki Kaisha. Impacting mechanism for impacting a piezo-electric body. 3,724,993, Cl. 431-255.000.

Gott, Hans: *See*—
Ritter, Josef; and Gott, Hans, 3,725,632.

Gough, Stanley T. D., to Mobil Oil Corporation. 1-(2-Cyanoethoxy)-2,2-dichlorovinyl phosphate esters. 3,725,511, Cl. 260-940.000.

Gouws, Wentzel Christoffel. Pressure moulding machine. 3,724,988, Cl. 425-348.000.

Gower, George H. Apparatus for manufacturing high pressure inert gas. 3,725,012, Cl. 23-281.000.

Grace, W. R., & Co.: *See*—
Kehr, Clifton L.; and Wszolek, Walter R., 3,725,228.

Kehr, Clifton L.; and Waszolek, Walter R., 3,725,229.
Legal, Casimer C., Jr., 3,725,265.
Levy, Newton, Jr.; Wirth, David Griffith, Jr.; and Rettew, Richard Raymond, 3,725,094.
Scanlon, Patricia M.; and Young, Elwyn R., 3,725,456.

Gradel, Wolf-Dietrich: *See—*
Stoeck, Georg; Budka, Heinz-Gunter; Topfmeier, Fritz; and Gradel, Wolf-Dietrich, 3,725,465.

Grafstein, Daniel: *See—*
Barnes, Robert L.; and Grafstein, Daniel, 3,725,176.

Graham, James T.; and Hackstock, Fred W., to Bendix Corporation, The. Over travel linkage for assembly machine station. 3,724,052, Cl. 29-200.00p.

Graham, William; and Wetherill, Lewis A., to Glaxo Laboratories Limited. Method of producing 7β-acylamido-3-methyiceph-3-em-4-carboxylic acid esters and catalysts therefor. 3,725,397, Cl. 260-243.00c.

Grahim Magnetics, Inc.: *See—*
Ehrreich, John E.; and Reti, Adrian R., 3,725,036.

Gramling, William D. Television signal converter. 3,725,570, Cl. 178-5.20r.

Grandjean, Philippe, to Sandoz Ltd. Difluoropyrimidylamino-group-containing metallized water-soluble reactive formazane dyes. 3,725,382, Cl. 260-146.00d.

Grant, Whitney I., to Vilter Manufacturing Corporation. Single stage dry cylinder compressor having automatic oil drain from suction chamber to crankcase. 3,724,231, Cl. 62-157.000.

Graver, Richard T. Jar opening fixture. 3,724,296, Cl. 81-3.30r.

Gray, George Carrol: *See—*
Caron, Fred Joseph; Caron, James Oliver; and Gray, George Carrol, 3,724,342.

Greaves, Richard Johnson, to Brownbuilt Limited. Storage facility. 3,724,389, Cl. 104-162.000.

Grebe, Konrad. Control for self-advancing hydraulic roof supports for longwall faces in mines. 3,724,329, Cl. 91-189.000.

Green, George C., to Devlieg Machine Company. Double bladed cutting tool. 3,724,965, Cl. 408-183.000.

Green, Jeffrey S. Tuna tower. 3,724,595, Cl. 182-118.000.

Green, Joseph E.: *See—*
Mayes, Nathan; Green, Joseph E.; and Michaels, Ronald, 3,725,374.

Greene, Ted J.: *See—*
Nitschke, Robert O., 3,724,452.

Greenwald, Richard B.: *See—*
Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzell, Bruce E., 3,725,548.

Greenwood, Arthur Raymond: *See—*
Vesely, Kenneth Donald; and Greenwood, Arthur Raymond, 3,725,249.

Greenwood, Arthur Raymond; and Vesely, Kenneth Donald, to Universal Oil Products Company. Method of operating a reforming process. 3,725,248, Cl. 208-138.000.

Greenwood, Robert; and Shepherd, John Michael, to T.M.M. (Research) Limited. Textile spinning machines. 3,724,194, Cl. 57-156.000.

Gregoire, Stephen E.: *See—*
Mc Keown, James E.; Gregoire, Stephen E.; and Michel, Donald E., 3,725,844.

Grell, Wolfgang; Griss, Gerhart; and Kleemann, Manfred, to Boehringer Ingelheim G.m.b.H. N-acyl-7-(N"-cycloalkyl-ureido-N'-sulfonyl)-isoquinolines and -benzazepines and alkali metal salts thereof. 3,725,388, Cl. 260-239.00b.

Greubel, Waldemar, to Siemens Aktiengesellschaft. Data exhibiting screen device with a liquid-crystal layer, and method of manufacture. 3,725,899, Cl. 340-324.00m.

Grewe, Ferdinand: *See—*
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, 3,725,549.

Grieger, Karl Heinz. Apparatus for illuminating transparent images, especially diapositives. 3,724,111, Cl. 40-106.100.

Griffey, Donald E., to Motorola, Inc. Dual mode power supply protection circuit. 3,725,739, Cl. 317-16.000.

Griffith, Francis C.: *See—*
Miller, Paul G.; Hsinchu, Taiwan; and Griffith, Francis C., 3,725,087.

Grigoriev, Vladimir Andreevich: *See—*
Kavepa, Alexandr Alexandrovich; Nitkovskikh, Anatoly Anatolievich; Grigoriev, Vladimir Andreevich; Pashkov, Arkady Borisovich; and Epshtein, Yakov Vulfovich, 3,725,013.

Gripentog, William G., to United States of America, Atomic Energy Commission. Electromagnetic disturbance neutralization radiation detector. 3,725,661, Cl. 250-83.60r.

Griss, Gerhart: *See—*
Grell, Wolfgang; Griss, Gerhart; and Kleemann, Manfred, 3,725,388.

Gross, James C.: *See—*
Dorsey, Robert L., Sr.; Gross, James C.; and Myers, H. George, 3,725,834.

Gross, Richard: *See—*
Von Der Eltz, Hans-Ulrich; and Gross, Richard, 3,724,997.

Grote, George A., to National Central Bank of York Pennsylvania; Administrator, d.b.n.c.t.a. of the estate of Beach, Willard C.; deceased and Administrator c.t.a. of the estate of Beach, Mary B. Cartridge for filter for moisture and oil vapor. 3,724,177, C. 55-316.000.

Groves, Warren Olley; Herzog, Arno Henry; and Craford, Magnus George, to Monsanto Company. $GaAs_1-P_x$ electroluminescent device doped with isoelectronic impurities. 3,725,749, Cl. 317-234.00r.

Grubb, Larry M., to Thuron Industries, Inc. Low temperature extrudable odor-neutralizing composition. 3,725,311, Cl. 252-522.000.

Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh. Max Grundig: *See—*
Kuhnlein, Dieter; Emmert, Reinhold; and Haag, Georg, 3,724,778.

Gschwend, Heinz Werner, to Ciba-Geigy Corporation. 1-Aralkyl-3-aminoindazoles. 3,725,431, Cl. 260-310.00c.

GTE Automatic Electric Laboratories Incorporated: *See—*
Krock, Elmer W.; and Simon, Charles J., 3,725,599.
Kuster, Karl H., 3,725,740.

GTE Sylvania Incorporated: *See—*
Armstrong, Donald E., 3,724,346.
Asplund, Robert W., 3,725,794.
Martin, Brice E.; and Mac Innis, Martin B., 3,725,524.
Miller, Charles H.; Broadt, David R.; and Armstrong, Donald E., 3,725,692.

Gubler, Kurt: *See—*
Brechbuhler, Hans Ulrich; and Gubler, Kurt, 3,725,418.

Gudenau, Heinrich-Wilhelm: *See—*
Wenzel, Werner; Schenck, Hermann; and Gudenau, Heinrich-Wilhelm, 3,725,038.

Guequen, Michel Marie Francois, to Camusat Gueguen France. Radio antenna structure. 3,725,946, Cl. 343-912.000.

Guertin, Clifford D.: *See—*
D'Amato, Salvatore F.; Guertin, Clifford D.; and Lednicer, Oliver, 3,725,694.

Guetersloh, Donald G., to General Motors Corporation. Fuel injection pump. 3,724,972, Cl. 417-220.000.

Guglielmetti, Leonardo: *See—*
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, 3,725,395.

Guichard, Claude Pierre Albert Louis: *See—*
Chaulet, Roger Louis; Guichard, Claude Pierre Albert Louis; Menissier, Pierre Lucien; and Soret, Jean-Claude Georges, 3,724,529.

Gulf & Western Industries, Inc.: *See—*
Pearson, Frank Arthur, 3,725,616.

Gulf Research & Development Company: *See—*
Cant, Noel W.; and Hall, William K., 3,725,482.
Carr, Norman L.; Kramer, Sheldon J.; and Stahlfeld, Donald L., 3,725,653.
Kobylinski, Tadeusz P.; and Swift, Harold E., 3,725,496.
Martini, Joseph C., 3,725,485.
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, 3,725,471.
Pachaly, Robert W., 3,724,226.

Gulf Research and Development Company: *See—*
Deffner, John F.; Tucci, Edmond R.; Thayer, Helen I.; and Ward, John V., 3,725,483.

Gulton Industries, Inc.: *See—*
Alton, Ahdor H.; and Kohn, Mitchell I., 3,725,783.

Gunderson, Philip D.; and Freimark, Ronald J., to Motorola, Inc. Volume and tone control for multi-channel audio systems. 3,725,583, Cl. 179-1.0vl.

Guneratne, Piyatilleke Perera, to United Kingdom Atomic Energy Authority. Electrical connectors for multiple thermocouple conductors. 3,725,847, Cl. 339-61.00m.

Gunther, Klaus: *See—*
Voigt, Hartman; Schneck, Erich; Gunther, Klaus; and Noha, Klaus, 3,725,491.

Gurney, Chester T.; and Gatti, Arnold P., to Motor Wheel Corporation. Sealed combustion forced air furnace. 3,724,442, Cl. 126-85.00b.

Gurney, Robert: *See—*
Olliges, William E.; Polanek, Edward L.; and Gurney, Robert, 3,725,759.

Gurnshaw, Terence: *See—*
Hopper, Norbert; and Gurnshaw, Terence, 3,724,191.

Gustavii, Klas Ragnar: *See—*
Brandstrom, Arne Elof; Gustavii, Klas Ragnar; Junggren, Ulf Krister; and Kylberg, Kerstin, 3,725,006.

Gustine, Floyd L.: *See—*
Diamond, Harold G.; and Gustine, Floyd L., 3,724,416.
Diamond, Harold G.; and Gustine, Floyd L., 3,724,755.

Guy, Thomas L.: *See—*
Edwards, Raymond S.; and Guy, Thomas L., 3,724,517.

Gwilliam, Ralph Derek, to English Clays Lovering Pochin & Company Limited. Tube pressure filters. 3,724,663, Cl. 210-85.000.

Gym-Dandy, Inc.: *See—*
Carlin, Edward T.; and White, Bobby L., 3,724,078.

H-C Industries, Incorporated: *See—*
Wilde, Sheldon L., 3,724,365.

Haag, Georg: *See—*
Kuhnlein, Dieter; Emmert, Reinhold; and Haag, Georg, 3,724,778.

Haas, Paul A., to United States of America, Atomic Energy Commission. Conversion of fuel-metal nitrate solutions to oxides. 3,725,293, Cl. 252-301.10r.

Habermeier, Juergen: *See—*

Porret, Daniel; and Habermeier, Juergen, 3,725,342.

Habuchi, Hirokazu: *See—*
Tamate, Tokutaro; Habuchi, Hirokazu; and Hirayama, Tsutomu, 3,724,957.

Hackstock, Fred W.: *See—*
Graham, James T.; and Hackstock, Fred W., 3,724,052.

Haede, Werner: *See—*
Stache, Ulrich; Fritsch, Werner; Haede, Werner; Radscheit, Kurt; and Lindner, Ernst, 3,725,393.

Haefner, Kenneth Browning; and Ringwall, Carl Gustav, to General Electric Company. Turn-up vortex valve. 3,724,478, Cl. 137-812.000.

Hagel, Adolf: *See—*
Zeingenberger, Arno; and Hagel, Adolf, 3,724,241.

Hager, Ahois, to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft. Method for improving the life of the refractory lining of the refining vessel of a spray refining plant. 3,725,042, Cl. 75-60.000.

Hager, George S.; Keech, Eugene E.; and Dossett, Lawrence S., to Electronic Engineering Co. of California. Reel spindle. 3,724,772, Cl. 242-68.300.

Hager, Robert J.; Hitchell, Maurice L.; and Tufte, Obert N., to Honeywell Inc. Process for preparing epitaxial layers of Hg $Hg_{1-x}Cd_x$. 3,725,135, Cl. 148-1.500.

Hagiwara, Yoshitoshi: *See—*
Honda, Sochiro; Hagiwara, Yoshitoshi; and Motoyoshi, Kenya, 3,725,048.

Hahn, Ernest A.: *See—*
Parker, Gordon M.; Wismer, Marco; and Hahn, Ernest A., 3,725,116.

Hahn, Hans Helmut: *See—*
Pretorious, Victor; and Hahn, Hans Helmut, 3,725,232.

Halasa, Adel F.; and Schroeder, Ervin E., to Firestone Tire & Rubber Company, The. Process for postreaction of alkali metal-active polymers with silicic compounds and dialkenyl compounds. 3,725,369, Cl. 260-85.100.

Halasa, Adel F.; and Schroeder, Ervin E., to Firestone Tire & Rubber Company, The. Process and product of treating live polymers with divinyl benzene and an active halogen compound. 3,725,370, Cl. 260-85.100.

Halcon International, Inc.: *See—*
Brown, David; and Saffer, Alfred, 3,725,307.
Golden, Richard L., 3,725,207.

Haldor Frederik Axel Topsoe: *See—*
Wrisberg, Johannes; Andersen, Kjeld Jorn; and Mogensen, Erik, 3,725,495.

Hall, Homer. Hydraulic hoe-method and means. 3,724,764, Cl. 239-587.000.

Hall, Lou H.: *See—*
Carbajal, Bernard G., III; Gosney, William Milton; and Hall, Lou H., 3,724,065.

Hall, Robert L., to Champion Laboratories, Inc. Filter unit. 3,724,665, Cl. 210-130.000.

Hall, William K.: *See—*
Cant, Noel W.; and Hall, William K., 3,725,482.

Hallberg, Irving H., to Borg-Warner Corporation. Automatic transmission control system. 3,724,205, Cl. 60-19.000.

Haller, Willis D.; and Colline, Raymond M., to Minnesota Mining and Manufacturing Company. Magnetic recording tape. 3,725,126, Cl. 117-235.000.

Halliburton Company: *See—*
Dill, Walter R., 3,724,549.

Halogen Controls, Inc.: *See—*
De Vale, Donald P., 3,724,474.

Halstead, Earle W., to Tru-Pitch, Inc. Ball throwing machine. 3,724,437, Cl. 124-1.000.

Hamal, Heinrich: *See—*
Kuhne, Rudolf; Hamal, Heinrich; and Thilenius, Thilo, 3,725,101.

Hamb, Frederick L.: *See—*
Jacoby, Frederick J.; Hamb, Frederick L.; and Trent, Lewis C., 3,725,329.

Hamb, Frederick L.; and Wilson, John C., to Eastman Kodak Company. Photographic element conprising film forming polymeric support. 3,725,070, Cl. 96-87.00r.

Hamilton Alloy Products, Inc.: *See—*
Lewandowski, Stephen H., 3,724,073.

Hamilton, Charles E., to Dow Chemical Company, The. Method for disposal of waste activated sludge. 3,724,542, Cl. 166-246.000.

Hamilton, Douglas D.: *See—*
Zehavi, Samuel; Boivin, Joseph J. R.; Hamilton, Douglas D.; and Ranzenhofer, Raoul, 3,724,518.

Hamilton-Fey, John, to International Computers Limited. Tape handling apparatus. 3,724,774, Cl. 242-180.000.

Hammond, Oswyn K., to Scott Paper Company. Diazo lithographic composition and article. 3,725,069, Cl. 96-75.000.

Hamner, Glen P.; and Mason, Ralph B., to Esso Research and Engineering Company. Cracking hydrocarbon residua to coke and aromatic gas oil. 3,725,242, Cl. 208-46.000.

Hancock, Robert J., to International Business Machines Corporation. Apparatus and method for establishing exact record reorientation after error condition in a data storage subsystem. 3,725,861, Cl. 340-146.10f.

Hanke, David E., to Kimberly-Clark Corporation. Water-dispersible insertion devices for tampons and the like. 3,724,462, Cl. 128-263.000.

Hanover Brands, Inc.: *See—*
Meckley, George E., 3,724,306.

Hanschke, Ernst; Fester, Walter; and Jakob, Franz, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Polyamines of xylened amines. 3,725,478, Cl. 260-570.50p.

Hansen, Lindsey B. Novel display device. 3,725,112, Cl. 117-75.000.

Hanson, Cleo E.; and Tuschhoff, John V., to Staley, A. E., Manufacturing Company. Method for purifying crude, dry granular reacted cold water swelling hydroxypropyl starch derivatives. 3,725,386, Cl. 260-233.30r.

Hanson, James M.: *See—*
Anderson, Robert M.; Hanson, James M.; Lecrone, Richard C.; and Landgraf, William B., 3,725,693.

Hanssen, Dieter; and Knecht, Adolf. Method of manufacturing rapidly disintegrating pharmaceutical tablets. 3,725,556, Cl. 424-357.000.

Hara, Takao, to Toyo Glass Company, Limited. Apparatus for arranging articles in staggered rows. 3,724,639, Cl. 198-31.00r.

Harada, Takeshi: *See—*
Inoue, Takashi; Masuda, Takao; and Harada, Takeshi, 3,724,431.

Harben, Grover S., Jr., to Gainesville Machine Company, Inc. Method for killing fowl. 3,724,032, Cl. 17-52.000.

Hardin, Charles H.: *See—*
Foley, Charles F.; McCarthy, Charles D.; and Hardin, Charles H., 3,724,124.

Hare, George H., to Singer Company, The. Calculator having a sequential access stack. 3,725,873, Cl. 340-172.500.

Harkey, Johnny D.: *See—*
Burgess, Douglas P.; and Harkey, Johnny D., 3,724,509.

Harkulich, Theodore M.: *See—*
Wainer, Eugene; Rose, Selwyn H.; and Harkulich, Theodore M., 3,724,066.

Harland, Philip W., to Ametek, Inc. Backhoe depth gauge. 3,724,278, Cl. 73-432.0ha.

Harnisch, Douglas R.: *See—*
Stefanucci, Arthur; Harnisch, Douglas R.; Coogan, Joseph E., III; and Scarsella, Edward L., 3,725,076.

Harper, John Ford. Buffing wheel. 3,724,140, Cl. 51-332.000.

Harrington, Daniel J.: *See—*
Cabell, Robert G.; Yancey, Thomas A.; Linville, Roy Norman; and Harrington, Daniel J., 3,724,439.

Harrington, Joseph Kenneth: *See—*
Trancik, Ronald J.; Scherrer, Robert A.; and Harrington, Joseph Kenneth, 3,725,451.

Harris Automated Machinery Co.: *See—*
Harris, Sterling G.; and Zober, Ben P., 3,724,031.

Harris, Garrett H.; Dutt, Edward A.; and Savage, Billy J., said Dutt and said Savage assors. to Herschede Hall Clock Company, The. Motor mounting structure. 3,724,790, Cl. 248-4.000.

Harris Paint Company: *See—*
Coffey, Charles A.; and Catena, Michael J., 3,725,119.

Harris, Robert H.; and Morey, Edward F. Waste water treatment. 3,725,263, Cl. 210-42.000.

Harris, Sterling G.; and Zober, Ben P., to Harris Automated Machinery Co. Method of shucking bivalves. 3,724,031, Cl. 17-48.000.

Harris-Intertype Corporation: *See—*
Mc Connell, Howard M.; and Zeewy, Abraham, 3,725,756.
Schaffer, Robert H.; and Crum, James N., 3,724,733.
Tokarz, Henry J., 3,725,763.
Treff, Ernest H., 3,724,368.

Harrison, Albert Keith; and Mather, John, to Imperial Chemical Industries Limited. Polyester modified with metal salts of sulfoisophathalic acid esters and polyethylene oxide) end capped with alkyl groups. 3,725,348, Cl. 260-75.00s.

Harrison, Albert Keith; and Mather, John, to Imperial Chemical Industries Limited. Fibers of polyesters prepared from ethylene glycol, dimethyl terephthalate, sodium dimethyl-5-sulphoisophthalate and poly(ethylene oxide). 3,725,351, Cl. 260-75.00s.

Harrison, William A.; and Kulka, Marshall, to Uniroyal Ltd., mesne. Certain 2,4-dimethyl-5-carboxamido-thiazoles. 3,725,427, Cl. 260-302.00r.

Harstead, Gunnar A.; Locante, John; and Russell, James G., to Westinghouse Electric Corporation. Nuclear containment system. 3,725,198, Cl. 176-37.000.

Hart, Edward Raymond: *See—*
Lauge, Raitis; and Hart, Edward Raymond, 3,724,978.

Hart, Graham Arthur Nigel: *See—*
Duncan, John; and Hart, Graham Arthur Nigel, 3,724,413.

Hart, Jack P., to General Motors Corporation. Regenerator seal. 3,724,533, Cl. 165-7.000.

Hartford National Bank and Trust Company: *See—*
Olmsted, Frederick S., 3,724,844.

Hartlage, James Albert; and Cronberg, Alvin Dale, to Ashland Oil, Inc. Solvent extraction process for the recovery of copper values. 3,725,046, Cl. 75-101.0be.

Hartley, Jack G., to United States of America, Air Force. Apparatus for clean sealing valves. 3,724,495, Cl. 137-547.000.

Hartman, William R., Jr.: *See—*
Draugelis, Vaidevutis C.; Hartman, William R., Jr.; Langdon, Michael J.; and McCarroll, Alan F., 3,724,943.

Hartmann & Braun Aktiengesellschaft: *See—*
Schaefer, Werner, 3,725,702.

Hartshorn, Derick S., Jr., to Ionitech Laboratories Incorporated. Plating titanium and zirconium and their alloys with nickel, chromium and other heavy metals. 3,725,217, Cl. 204-32.00r.

Harvey, Douglas J., to General Motors Corporation. Heat treatable creep resistant solder. 3,725,144, Cl. 148-127.000.

Hascic, Wladimir: *See—*
Eder, Otto; and Hascic, Wladimir, 3,724,104.

Hasegawa, Shinichi: *See—*
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.

Hashimoto, Makoto: *See—*
Maezawa, Shiro; Yoshikawa, Hiroshi; Sakamoto, Kenji; Fujii, Jun; and Hashimoto, Makoto, 3,725,208.

Hashimoto, Novuyoshi: *See—*
Otsuka, Eiji; Kanai, Kazumichi; Inoue, Shigeru; and Hashimoto, Novuyoshi, 3,725,210.

Hashimoto, Tadashi: *See—*
Miura, Taro; Nakamura, Kiichi; and Hashimoto, Tadashi, 3,725,823.

Hashimoto, Takao: *See—*
Takahashi, Makoto; and Hashimoto, Takao, 3,724,955.

Hashimoto, Yasuyuki; and Torii, Osamu, to Mitsubishi Pencil Co., Ltd. Mechanical pencil with retractable core pipe. 3,724,960, Cl. 401-67.000.

Haskon Incorporated: *See—*
Olila, Howard E., 3,724,093.

Hass, Robert H.; Mickelson, Grant A.; Baral, William J.; Reeg, Cloyd P.; Attane, Edward C., Jr.; and Jones, Darryl L., to Union Oil Company of California. Hydrocarbon conversion catalysts comprising phosphorus and aluminosilicates. 3,725,243, Cl. 208-59.00.

Hatcher, Cecil W.; and Warner, Gene, to Pavement Grooving Ideas, Ltd. Concrete pavement cutting machine. 3,724,900, Cl. 299-39.000.

Hauck, Erwin A., to Burroughs Corporation. Data processor having an addressable local memory linked to a memory stack as an extension thereof. 3,725,876, Cl. 340-172.500.

Haupin, Warren E.: *See—*
Russell, Allen S.; Knapp, Lester L.; and Haupin, Warren E., 3,725,222.

Hauser, Raimund: *See—*
Von Belvard, Peter Revy; and Scheiber, Robert, 3,724,349.

Haviland, Joseph M., to Haviland Products Company. Process for removing metal compound contaminants from waste water. 3,725,266, Cl. 210-45.000.

Haviland Products Company: *See—*
Haviland, Joseph M., 3,725,266.

Hawkins, Harold V.; Dick, Ralph A.; and Parlow, Alfred M., to Columbus McKinnon Corporation. Hoist operating hand wheel incorporating an overload protection mechanism. 3,724,815, Cl. 254-169.000.

Hawkins, John Charles; and Waite, William, to Rubery, Owen & Co. Limited. Means for mounting freight containers on trailers and other vehicles. 3,724,796, Cl. 248-361.000.

Hawthorne, Nathaniel F. Ski spurs. 3,724,867, Cl. 280-11.13c.

Hayashi, Yoshiki; and Masanaru, Hasegawa, to Matsushita Electric Industrial Co., Ltd. Dual layered photoreceptor employing selenium sensitizer. 3,725,058, Cl. 96-1.500.

Hayes, Leonard L., to Potlatch Forests, Inc. Sheet discharge mechanism. 3,724,841, Cl. 271-68.000.

Hayman, William: *See—*
Windecker, John C.; and Hayman, William, 3,724,081.

Hayner, Paul F.; and Brockway, Richard J., to Sanders Associates, Inc. Gas pressure reducing restrictors. 3,724,502, Cl. 138-41.000.

Haynes, Lawrence B. Stolen article detection. 3,725,895, Cl. 340-280.000.

Heat Sealing Equipment, Mfg., Co.: *See—*
Pizmoht, Frank, 3,724,167.

Heck, Wolfgang: *See—*
Schulze, Gerhard; and Heck, Wolfgang, 3,725,537.

Hecker, Alfred, to Anker-Werke Aktiengesellschaft. Device for registering business machines. 3,724,750, Cl. 235-145.00r.

Hederich, Volker: *See—*
Gehrke, Gunter; Hederich, Volker; Neeff, Rutger; and Wegner, Peter, 3,724,998.

Heeks, Robert E.; and Sullivan, Donald P., to Xerox Corporation. Light developable, direct writing, silver halide emulsions containing gold, iodine, lead and copper. 3,725,073, Cl. 96-108.000.

Heen, Helge K., to Adaks Products Incorporated. Apparatus for cleaning sewage water. 3,725,205, Cl. 202-181.000.

Heffran, Vernon C., to Owens-Illinois, Inc. Convenience opening closure. 3,724,700, Cl. 215-46.00a.

Heidacker, Walter C., to General Motors Corporation. Engine oil pan. 3,724,599, Cl. 184-6.500.

Heidorn, John H., to General Motors Corporation. Electromagnetic clutch. 3,724,621, Cl. 192-84.00c.

Heightley, John Donnell, to Bell Telephone Laboratories, Incorporated. Threshold logic digital filter. 3,725,687, Cl. 235-164.000.

Heil, Eduard: *See—*
Bolte, Herbert; Wittmer, Paul; and Heil, Eduard, 3,725,506.

Heinz, William. Timer operated automatic shut-off for fluid dispensing pumps. 3,724,746, Cl. 222-70.000.

Heitzer, Karl: *See—*
Albinger, Walter; and Heitzer, Karl, 3,725,164.

Held, Llewellyn John: *See—*
Pieri, Giovanni; Aldo, Novara; Held, Llewellyn John; and Bedetti, Gianfranco, 3,725,526.

Helfgen, Werner: *See—*
Rohde, Wilhelm; and Helfgen, Werner, 3,724,318.

Helgeson, Peter L.: *See—*
Clark, Robert A.; and Helgeson, Peter L., 3,724,440.

Heliotes, John S. Quick installation door frame and method. 3,724,135, Cl. 49-504.000.

Hell, Rudolf, Dr.-Ing., GmbH: *See—*
Gast, Uwe, 3,725,574.

Helmerson, Per-Erik, to Lectus AB. Lining board. 3,724,156, Cl. 52-613.000.

Helms, Gerd: *See—*
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert, 3,725,211.

Henderson, James R. Pressurized dough container and method of opening the same. 3,724,742, Cl. 229-51.0bp.

Hendricks, Laurel A. Sanitary napkin. 3,724,466, Cl. 128-290.00r.

Hendry, George O.; and Wells, Dale K., to Cyclotron Corporation, The. Cyclotron beam extraction. 3,725,709, Cl. 313-62.000.

Hendus, Hans: *See—*
Kunde, Joachim; Ramlow, Gerhard; Buechler, Guenter; Pohlemann, Heinz; and Hendus, Hans, 3,725,503.

Henkel & Cie G.m.b.H.: *See—*
Stein, Werner; Plapper, Jurgen; and Willmund, Wolf-Dieter, 3,724,999.

Hennion, Jean-Claude M. L.: *See—*
Lefebvre, Michel S. M.; and Hennion, Jean-Claude M. L., 3,724,088.

Hercules Incorporated: *See—*
Kim, Charles W., 3,724,198.

Herker, Dietrich: *See—*
Schneider, Karl-Heinz; Herker, Dietrich; Madgefrau, Herbert; Plockl, Alfons; and Horrwarth, Ernst, 3,725,620.

Herman, Elvin E.; and McCord, Henry L., to Hughes Aircraft Company. High resolution mapping system. 3,725,915, Cl. 343-5.0pc.

Hernick, Jack Frank. Automobile hoist. 3,724,602, Cl. 187-8.540.

Herold, Stanley J.: *See—*
Beatty, Bobby D.; Butts, Gary D.; Herold, Stanley J.; and La Grange, Donald E., 3,724,385.

Heron Establishment: *See—*
Garavelli, Giancarlo, 3,724,234.

Herrnring, Heinz Gunther, to Montblanc-Simplo GmbH. Fountain pen. 3,724,962, Cl. 401-223.000.

Herschede Hall Clock Company, The: *See—*
Harris, Garrett H.; Dutt, Edward A.; and Savage, Billy J. (said Dutt and said Savage assors. to), 3,724,790.

Herzog, Arno Henry: *See—*
Groves, Warren Olley; Herzog, Arno Henry; and Craford, Magnus George, 3,725,749.

Hess, Howard V.: *See—*
Wilson, Raymond F.; Peck, Reese A.; Carter, Norman D.; Cole, Edward L.; and Hess, Howard V., 3,725,250.

Hesse, Kurt, to Staff & Schwarz G.m.b.H. Electrical plug and socket coupling for connecting electrical leads. 3,725,840, Cl. 339-14.00r.

Hewlett-Packard Company: *See—*
Turner, Wilson R., 3,725,700.
Yen, Chu-Sun, 3,725,765.

Heyman, Karl: *See—*
Messerschmidt, Harold J.; Heyman, Karl; and Johnsen, Bernadou W., II, 3,725,159.
Messerschmidt, Harold J., Jr.; Heyman, Karl; and Johnsen, Bernadou W., II, 3,725,158.

Hicks, Hjalmar L., to Hicks, Kenneth A. and Kaye, Linda. Telltale hinge mounting for doors. 3,724,025, Cl. 16-128.000.

Hicks, Kenneth A.: *See—*
Hicks, Hjalmar L., 3,724,025.

Hidinger, David C., Jr.: *See—*
Uelzmann, Heinz; and Hidinger, David C., Jr., 3,725,460.

Hilbelink, Ronald D.; and Peters, Gavin H., to National Cash Register Company, The. Intercrossing resin-curing agent adhesive systems. 3,725,501, Cl. 260-824.00r.

Hill, Uno T., to Inland Steel Company. Annealing steel products. 3,725,141, Cl. 148-16.000.

Hillesland, Harold L.: *See—*
Wiedeman, Robert A.; and Hillesland, Harold L., 3,725,564.

Hillman, Arnold R. Safety cable for trailer hitch. 3,724,875, Cl. 280-457.000.

Hinata, Masanao: *See—*
Shiba, Keisuke; Hinata, Masanao; Yamasue, Koutaro; and Kondo, Tokiharu, 3,725,074.

Hines, Claude M. Remote control system for automatic car uncoupling device. 3,724,680, Cl. 213-212.000.

Hinson, Robert E., Jr.: *See—*
Holland, Charles E.; Hinson, Robert E., Jr.; and Putnam, Richard V., 3,724,196.

Hirakawa, Michio: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Hirakawa, Michio, 3,725,336.

Hirayama, Tsutomu: *See—*
Tamate, Tokutaro; Habuchi, Hirokazu; and Hirayama, Tsutomu, 3,724,957.

Hiromori, Kunio: *See—*
Katagiri, Takeo; Hiromori, Kunio; Yoshimura, Shoichiro; Suda, Kazuyoshi; and Tanaka, Jinichi, 3,724,657.

Hirschman, Paul S.: *See—*
Day, John J.; and Hirschman, Paul S., 3,724,423.

Hirzel, Edgar A., to Crane Co. Controlled wheel braking system. 3,724,916, Cl. 303-21.0be.

Hitachi, Ltd.: *See—*
Maki, Michiyoshi, 3,725,145.
Murayama, Yoshimasa, 3,725,743.
Muroi, Tadashi; Oguri, Yoshitaka; and Ishida, Masahiko, 3,725,075.
Oushige, Takayoshi; Kinoshita, Yukio; Iizuka, Kikuo; and Nishimiya, Yutaka, 3,725,808.

Hitchell, Maurice L.: *See—*
Hager, Robert J.; Hitchell, Maurice L.; and Tufte, Obert N., 3,725,135.

Hitco: *See—*
Caruso, Bernard E., 3,725,117.

Hjorth, Bo, to Siemens Aktiengesellschaft. Apparatus for evaluating a signal. 3,725,690, Cl. 235-183.000.

HMW Industries, Inc.: *See—*
Bergey, John M., 3,724,201.

Hobbs, Charles C., Jr.: *See—*
MacLean, Alexander F.; Hobbs, Charles C., Jr.; and Dougherty, Edward F., 3,725,487.

Hobbs, James: *See—*
Perkins, Earl Stuart; and Hobbs, James, 3,725,933.

Hobbs, Russell, Limited: *See—*
Masters, Leonard Kenneth Morgan; and Dalziel, Thomas, 3,724,359.

Hobo, Nobuhito: *See—*
Nagata, Senichi; Ogawa, Oyuki; and Hobo, Nobuhito, 3,724,436.

Hodan, James J.: *See—*
Dever, James L.; and Hodan, James J., 3,725,510.

Hofelt, Clarence, Jr.; and Corl, John E., to General Tire & Rubber Company, The. Means for correcting non-uniformity in tires. 3,724,137, Cl. 51-106.000.

Hofelt, Clarence, Jr., to General Tire & Rubber Company, The. Method of improving performance characteristics of pneumatic tires. 3,725,163, Cl. 156-64.000.

Hoffman, Clifford James, to Bell Telephone Laboratories, Incorporated. Machine control by acoustic energy. 3,725,602, Cl. 179-90.00r.

Hoffmann, Irmgard: *See—*
Kuch, Heinz; Schmitt, Karl; Seidl, Gunther; and Hoffmann, Irmgard, 3,725,404.

Hoffmann-La Roche Inc.: *See—*
Bretschneider, Hermann; Kaiser, Ado; and Hohenlohe-Oehringen, Kraft, 3,725,470.
Horvath, Csaba; and Lipsky, Seymour R., 3,725,111.

Hofstede, Marinus Johannes; and Logman, Hendrik, to Cojafex N.V. Apparatus for bending elongate objects. 3,724,258, Cl. 72-342.000.

Hohenlohe-Oehringen, Kraft: *See—*
Bretschneider, Hermann; Kaiser, Ado; and Hohenlohe-Oehringen, Kraft, 3,725,470.

Holbert, Harry C. Automatic line traverse and dip film processor. 3,724,353, Cl. 95-89.00d.

Holden, Homer N.: *See—*
Kleykamp, Donald L.; Gaster, Ivan; Browning, Vernon D.; and Holden, Homer N., 3,724,507.
Kleykamp, Donald L.; Gaster, Ivan; Browning, Vernon D.; and Holden, Homer N., 3,725,178.

Holden, John James Edmund: *See—*
Baker, William Albert; Barker, Anthony Sydney Charles; Holden, John James Edmund; and Winterburn, Stanley Pilkington, 3,724,252.

Holland, Charles E.; Hinson, Robert E., Jr.; and Putnam, Richard V., to Celanese Corporation. High speed texturing of synthetic continuous filament yarn. 3,724,196, Cl. 57-77.400.

Holland, Gerald F., to Pfizer Inc. Carboxamidobenzoic acids as hypolipemic agents. 3,725,417, Cl. 260-293.770.

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Bier, Kenneth C., 3,724,435.

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Honda, Sochiro; Hagiwara, Yoshitoshi; and Motoyoshi, Kenya, 3,725,048.

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Johnson, Justin O., Jr., 3,725,236.
Kefalas, John H.; and Lukianov, Roman E., 3,725,882.
Pollack, Michael J.; and Weidner, Evert C., 3,725,133.

Honeywell Information Systems Inc.: *See—*
Huettner, Robert E.; Tymann, Edward B.; and Nolin, Richard, 3,725,871.
Olney, Frederick Darwin, Jr., 3,724,409.
Olsen, Richard E., 3,725,675.

Hong, Sung Ho: *See—*
Appel, David W.; and Hong, Sung Ho, 3,724,094.

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Blackwood, John C.; Hook, Edwin O.; and Beck, Walter, 3,725,476.

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Gauzza, Harry J.; and Horanoff, Eugene V., 3,724,782.

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Sakai, Yoshinori; and Hori, Takashi, 3,725,381.

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Satoh, Susumu; Tanaka, Hideki; Ono, Shujiro; and Horiguchi, Hiroshi, 3,725,049.

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Wainer, Eugene; Rose, Selwyn H.; and Harkulich, Theodore M., 3,724,066.

Horner, Robert D., to Tahitian Products Co., Inc. Method of packaging consumable liquids. 3,725,086, Cl. 99-189.000.

Hornig, Lothar: *See—*
Boldt, Manfred; Arpe, Hans-Jurgen; and Hornig, Lothar, 3,725,462.

Horrwarth, Ernst: *See—*
Schneider, Karl-Heinz; Herker, Dietrich; Madgefrau, Herbert; Plockl, Alfons; and Horrwarth, Ernst, 3,725,620.

Horstmann, Richard E.: *See—*
Ames, Irving; D'Heurle, Francois M.; and Horstmann, Richard E., 3,725,309.

Horvath, Csaba; and Lipsky, Seymour R., to Hoffmann-La Roche Inc. Method of coating glass beads with a low cross-linked polymer. 3,725,111, Cl. 117-54.000.

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Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,724,726.
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Hosokoshi, Kakuichiro, to Matsushita Electronics Corporation. Method and apparatus of making color cathode ray tube. 3,725,106, Cl. 117-33.5cm.

Hossmann, Marcel: *See—*
Kupfer, Hanspeter; and Hossmann, Marcel, 3,725,920.

Hotchkiss, Marvin E.: *See—*
Thrower, Arthur J.; and Hotchkiss, Marvin E., 3,724,623.

Houdaille Industries, Inc.: *See—*
Konvalina, John, 3,725,652.

Houghton, Norman F., to Philco-Ford Corporation. Apparatus for forming articles comprising a pair of adjacent walled structures unidirectionally presented openings. 3,724,989, Cl. 425-388.000.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz-Wander, Inc. Substituted α~α~γ-triphenyl-aminopropanols. 3,725,412, Cl. 260-268.0bz.

Housel, John R., to Housel-Miller, Inc. Wheel hub. 3,724,907, Cl. 301-105.00r.

Housel-Miller, Inc.: *See—*
Housel, John R., 3,724,907.

Howard, Joseph A. Reversible ratchet-type wrench. 3,724,298, Cl. 81-63.000.

Hoya, Wallace K.: *See—*
Judd, Claude I.; and Hoya, Wallace K., 3,725,419.

Hrdina, Karel: *See—*
Jekl, Frantiek; Mateju, Vladimir; Pech, Josef; and Hrdina, Karel, 3,724,508.

Hsieh, Henry L., to Phillips Petroleum Company. Multilithium polymerization initiators. 3,725,488, Cl. 260-665.00r.

Hsinchu, Taiwan: *See—*
Miller, Paul G.; Hsinchu, Taiwan; and Griffith, Francis C., 3,725,087.

Hu nter, Edwin J., to Moist O'Matic; division of Toro Manufacturing. Rotary pop-up sprinkler. 3,724,757, Cl. 239-205.000.

Huband, Frank L.: *See—*
Balir, Charles M.; and Huband, Frank L., 3,725,859.

Hubbard, Glenn R., to Webster Electric Company, Inc. Spool release and sequence valve. 3,724,483, Cl. 137-106.000.

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Hudnall, Frederick W., to Textron, Inc. Underfloor entrance means. 3,724,150, Cl. 52-221.000.
Hudson, William Jeffery, Jr., to AMP Incorporated. Filtered socket for electronic circuit board. 3,725,825, Cl. 333-79.000.
Hudswell Yates Developments Limited: *See*—
Clayton, Eric Arthur, 3,724,108.
Huerta, James R.; and Meyer, Jeffrey G., to Dart Industries, Inc., mesne. Vanadium organometallic compounds and polymerization catalysts thereof. 3,725,444, Cl. 260-429.00k.
Huettner, Robert E.; Tymann, Edward B.; and Nolin, Richard, to Honeywell Information Systems Inc. Multi function pulling technique. 3,725,871, Cl. 340-172.500.
Huffman, Richard D., to Gerity-Schultz Corporation. Molten metal strainer. 3,724,831, Cl. 266-38.000.
Huggart, Richard L.: *See*—
Barron, Rodger W.; Fellers, Paul J.; and Huggart, Richard L., 3,725,083.
Hughes Aircraft Company: *See*—
Herman, Elvin E.; and McCord, Henry L., 3,725,915.
Moulin, Robert L., 3,725,845.
Ustach, Gerald S., 3,725,686.
Westphal, Teddy M., 3,724,709.
Hughes, David Geoffrey, to Decca Limited. Receivers for phase comparison radio navigation systems. 3,725,932, Cl. 343-105.00r.
Hugon, Pierre: *See*—
Beregi, Laszlo; Hugon, Pierre; and Le Douarec, Jean-Claude, 3,725,432.
Hullot, Pierre. Heat-sealable coatings of improved wettability and methods of producing the same. 3,725,098, Cl. 106-180.000.
Hummel, Floyd A.; and Sarver, James F., Jr., to Ferro Corporation. Inorganic pigments. 3,725,102, Cl. 106-288.00b.
Hund, Franz: *See*—
Rodi, Fritz; and Hund, Franz, 3,725,281.
Hunger, Klaus, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Lubricant compositions. 3,725,278, Cl. 252-46.700.
Huniu, Sam, to FMC Corporation. Anti-cavitation system for fluid loading arms. 3,724,499, Cl. 137-615.000.
Hunsucker, Jerry H. Polymeric substances comprising the reaction product of melamine, aldehyde and oxazolidines. 3,725,350, Cl. 260-67.500.
Hunt, William J.: *See*—
Love, Fred W.; and Hunt, William J., 3,725,167.
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Hunter, Irving R.; and Walden, Mayo K., to United States of America, Agriculture. 1,4,5,6-Tetrahydro-2-acetopyridine, its salts and bisulphite addition products, and synthesis thereof. 3,725,425, Cl. 260-297.00r.
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Hurlburt, Joseph C., to Sperry Rand Corporation. Reel drive train. 3,724,183, Cl. 56-14.300.
Hurst, Thomas P., to Illinois Tool Works Inc. Rivet setting apparatus. 3,724,738, Cl. 227-147.000.
Hurtubise, Horace. Cutting tool for pelts or the like. 3,724,071, Cl. 30-287.000.
Husband's Shipyards Limited: *See*—
Duncan, John; and Hart, Graham Arthur Nigel, 3,724,413.
Huseby, Robert A., to Smith, A. O.-Inland, Inc. Atomized steel powder having improved hardenability. 3,725,142, Cl. 148-16.000.
Hutchinson, William Y.; and Kushmuk, Walter P. Weighing and height measuring device. 3,724,574, Cl. 177-210.000.
Hutchison, Miller R., Jr., to Eastman Kodak Company. Device for converting linear motion to rotational motion. 3,724,283, Cl. 14-99.000.
Huttenlocher, Dieter: *See*—
Schneck, Waldemar; and Huttenlocher, Dieter, 3,724,421.
Huttenlocher, Walter: *See*—
Schneck, Waldemar; and Huttenlocher, Dieter, 3,724,421.
Hutton, Gerald E., to American Telephone and Telegraph Company. Communication call holding circuit. 3,725,600, Cl. 179-99.000.
Hydro Conduit Corporation: *See*—
Breitfuss, Thomas K.; Wallace, Floyd L.; and Zicaro, Joseph P., 3,724,768.
Hydrocarbon Research, Inc.: *See*—
Alpert, Seymour B.; Wolk, Ronald H.; Chervenak, Michael C.; and Nongbri, Govanon, 3,725,251.
Chervenak, Michael C., 3,725,241.
Johnson, Axel R.; and Wolk, Ronald H., 3,725,247.
Hylak, Peter J.: *See*—
Notko, Michael F.; and Hylak, Peter J., 3,724,399.
Ichimori, Masuo; and Suzaki, Hideyuki, to Omron Tateisi Electronics Co. Automatic water-supply apparatus. 3,724,001, Cl. 4-166.000.
Iida, Eiichi: *See*—
Takeda, Masao; Iida, Eiichi; Komatsubara, Tsuneo; and Kagoshima, Yutaka, 3,725,325.
Iida, Kazumi, to Sony Corporation. Multisound reproducing apparatus for deriving four sound signals from two sound sources. 3,725,586, Cl. 179-1.00g.
Iida, Yoshio: *See*—
Wada, Mitsuo; Nishimoto, Kazuyuki; Aoki, Masaki; and Iida, Yoshio, 3,725,836.
IIT Research Institute: *See*—
Camras, Marvin, 3,725,608.
Iizuka, Kikuo: *See*—
Oushige, Takayoshi; Kinoshita, Yukio; Iizuka, Kikuo; and Nishimiya, Yutaka, 3,725,808.
Ilegems, Marc; and Panish, Morton B., to Bell Telephone Laboratories, Incorporated. Liquid phase diffusion technique. 3,725,149, Cl. 148-186.000.
Illinois Tool Works Inc.: *See*—
Hurst, Thomas P., 3,724,738.
Sygnator, Henry A., 3,724,315.
Imamura, Hitoshi; and Katakura, Keiji, to Tokyo Shibaura Electric Co., Ltd. Assembling device. 3,724,740, Cl. 228-6.000.
Impact Industrial Holdings Limited: *See*—
Chippendale, John, 3,724,310.
Imperial Chemical Industries Limited: *See*—
Austin, Peter William; Crabtree, Allen; Leng, John Lindley; Robert, Denis; Ridyard, Annesley; and Young, Elliott, 3,725,383.
Bengtson, Olle, 3,725,318.
Bevan, Ronald, 3,724,685.
Bloom, Martin S., 3,725,191.
Bowden, Roy Dennis; and Seaton, Thomas, 3,725,414.
Harrison, Albert Keith; and Mather, John, 3,725,348.
Harrison, Albert Keith; and Mather, John, 3,725,351.
Inaba, Yukio: *See*—
Yamada, Keisho; Nishimura, Kenji; Furusaki, Shinichi; Toshimitsu, Tatsuo; and Inaba, Yukio, 3,725,459.
Inductosyn Corporation: *See*—
Tripp, Robert W., 3,725,654.
Industrial Nucleonics Corporation: *See*—
Varner, Donald E., 3,724,468.
Industrial Science & Technology, Agency of: *See*—
Ando, Tadanao; Kataoka, Seiichi; and Shiihara, Isao, 3,725,347.
Industrial Tool Engineering Company: *See*—
Celovsky, Michael E., 3,724,059.
Industrie Pirelli, S.p.A.: *See*—
Vecellio, Bernardino; and Casa, Fausto, 3,725,177.
Ingersoll-Rand Company: *See*—
Tibbott, David W., 3,724,560.
Ingerson, Quentin F., to Ampco-Pittsburgh Corporation. Aluminum bronze alloy having improved mechanical properties at elevated temperatures. 3,725,056, Cl. 75-154.000.
Ingram, James A.: *See*—
Mathews, Harold F.; Reeder, Jack M.; and Ingram, James A., 3,725,603.
Inland Steel Company: *See*—
Hill, Uno T., 3,725,141.
Innes, William B. Analysis of reactive materials in gas streams. 3,725,005, Cl. 23-232.00e.
Inoue, Shigeru: *See*—
Otsuka, Eiji; Kanai, Kazumichi; Inoue, Shigeru; and Hashimoto, Novuyoshi, 3,725,210.
Inoue, Takashi; Masuda, Takao; and Harada, Takeshi, to Diesel Kiki Kabushiki Kaisha. Electromagnetic fuel injection device for internal combustion engines. 3,724,431, Cl. 123-32.0ea.
Inoue, Tokuta: *See*—
Tanasawa, Yasusi; Inoue, Tokuta; and Ishiguro, Kenji, 3,724,220.
Insta-Datic Corporation: *See*—
Retzky, Clarence M., 3,725,647.
Institut Francois du Petrole, des Carburants et Lubrifiants: *See*—
Lesage, Jean; and Dawans, Francois, 3,725,331.
Institute "Rudjer Boskovic": *See*—
Petrinovic, Marko, 3,725,776.
Instrumentation Industries, Inc.: *See*—
Eross, Bela, 3,724,489.
International Business Machines Corporation: *See*—
Fuller, Sterritt R., Jr.; Munzel, Howard E.; and Woosley, Kenneth D., 3,725,118.
Ames, Irving; D'Heurle, Francois M.; and Horstmann, Richard E., 3,725,309.
Andresen, Rolf, 3,725,885.
Beausoleil, William F., 3,724,749.
Berding, Andrew R., 3,725,878.
Clark, William A., IV; Salmond, Kent A.; and Stafford, Thomas S., 3,725,864.
Denk, Hans H.; and Sabad, Joseph J., 3,725,285.
Dimmick, Roger F., 3,724,479.
Edstrom, Gene H.; and Lutter, Edward P., 3,725,655.
Featherston, John Richard, 3,725,787.
Gibson, David K.; and Johnson, Frederick W., 3,724,942.
Hancock, Robert J., 3,725,861.
Kay, Robert C., 3,724,702.
Kazan, Benjamin, 3,725,731.
Kilmer, Charlie C.; and Orchard, Robert J., 3,725,584.
Korb, Frank J.; and Schaefer, John O., 3,724,633.
Martin, David H., 3,725,879.
McCurry, Robert E., 3,725,951.
Oswald, Richard K., 3,725,764.
Roberts, David C., 3,725,862.
Stauffer, Russell A., 3,724,725.
International Computers Limited: *See*—
Angold, Edward Barnabas, 3,725,607.
Hamilton-Fey, John, 3,724,774.
International Salt Company: *See*—
Jacoby, Charles H., 3,724,898.

International Standard Electric Corporation: *See*—
Bosc, Henri J.; Castets, Michel G.M.; and Debuisser, Jean-Claude A., 3,725,923.
Earp, Charles William, 3,725,786.
Verstegen, Willi, 3,725,590.

International Telephone and Telegraph Corporation: *See*—
Moniak, John; and Bridenbaugh, Edwin R., 3,725,585.
Sapir, Said, 3,724,535.
Spanos, William M., 3,725,929.
Spanos, William M., 3,725,943.
Strain, Robert Allen, 3,725,846.
Talmo, Robert Eugene, 3,725,665.

Intersil Incorporated: *See*—
Dellor, Roger B., 3,725,881.

Interstate Restaurant Supply Company, Inc.: *See*—
Weston, David C., 3,724,699.

Ionitech Laboratories Incorporated: *See*—
Hartshorn, Derick S., Jr., 3,725,217.

IPC Services Limited: *See*—
Ashworth, John Vernon; and Smith, John Hugh, 3,725,569.

Ippen, Erich Peter: *See*—
Ashkin, Arthur; Ippen, Erich Peter; and Kompfner, Rudolf, 3,725,810.

Irby, James E. Impact receiving exercise device. 3,724,845, Cl. 272-76.000.

Ischer, John J., to North American Rockwell Corporation. Digital correlation pattern tracker. 3,724,923, Cl. 356-158.000.

Ishida, Masahiko: *See*—
Muroi, Tadashi; Oguri, Yoshitaka; and Ishida, Masahiko, 3,725,075.

Ishida, Shuichi: *See*—
Ohmori, Kaour; Nakajimatokyo, Mituo; Ishida, Shuichi; and Yamada, Osamu, 3,725,445.

Ishigaki, Yoshio: *See*—
Yoshida, Susumu; and Ishigaki, Yoshio, 3,725,725.

Ishiguro, Kenji: *See*—
Tanasawa, Yasusi; Inoue, Tokuta; and Ishiguro, Kenji, 3,724,220.

Ishii, Masao: *See*—
Suyama, Fujio; Yamamoto, Tokuo; Shimono, Kenichi; Kuwahara, Hirosi; Ishii, Masao; and Watanabe, Ichiro, 3,725,195.

Ishikawa, Mineo, to Toyoda Koki Kabushiki Kaisha. Grinding resistance detecting device. 3,724,138, Cl. 51-165.00r.

Ishland Oil, Inc.: *See*—
Kmecak, Ronald A.; and Kovach, Stephen M., 3,725,246.

Isuzu Motors Limited: *See*—
Mayuzumi, Harutaka; Shinoda, Motoyuki; and Akizuki, Kosuke, 3,724,046.

Itek Corporation: *See*—
Breslow, Donald H.; and Wingate, Sidney A., 3,725,904.
Brown, Deane David, 3,725,829.

Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, to Sumitomo Chemical Company, Ltd. Method for xidizing alkylated aromatic compounds. 3,725,484, Cl. 260-610.00b.

Itoo, Takamichi: *See*—
Narita, Kiichi; Mori, Takasuke; and Itoo, Takamichi, 3,724,528.

Itter, Friedhelm, to Barmer Barmag Maschinenfabrik Aktiengesellschaf. Distributor for viscous fluid spinning melts or solutions. 3,724,492, Cl. 137-597.000.

Iwamoto, Minoru: *See*—
Kanno, Tadaaki; and Iwamoto, Minoru, 3,724,949.

Izumi, John, to Detachable lamp socket assembly. . 3,725,850, Cl. 339-92.00r.

Izzo, Patrick Thomas: *See*—
Tomcufcik, Andrew Stephen; Izzo, Patrick Thomas; and Fabio, Paul Frank, 3,725,407.

Jackson, Byron, Inc.: *See*—
Scott, Lyle B., 3,724,501.

Jackson, Isaac S.: *See*—
Sheridan, David S.; and Jackson, Isaac S., 3,725,522.

Jackson, Lawrence D. A., to Lawjack Equipment Limited. Pinch valve sleeve. 3,724,807, Cl. 251-7.000.

Jacobs, F. L., Co.: *See*—
Olsen, Harry C.; Tischler, Ludwig J.; and Wernecke, Heinz C., 3,724,730.
Olsen, Harry C.; Tischler, Ludwig J.; and Wernecke, Heinz C., 3,724,928.

Jacobson, Kenneth E., to Beckman Instruments, Inc. Centrifuge indexing seal head assembly and method. 3,724,748, Cl. 233-21.000.

Jacobson, Leonard P., to Burt, F. N., Company, Inc. Sealable carton. 3,724,741, Cl. 229-38.000.

Jacoby, Charles H., to International Salt Company. Solution mining of salt and storage of industrial fluids. 3,724,898, Cl. 299-5.000.

Jacoby, Frederick J.; Hamb, Frederick L.; and Trent, Lewis C., to Eastman Kodak Company. Photographic subbing material. 3,725,329, Cl. 260-32.80r.

Jagaciak, George J.: *See*—
Velten, Edmund M.; Jagaciak, George J.; Wambold, John N.; and Epstein, Arthur, 3,724,050.

Jahn, Gunenter. Pipe or conduit clean out trap assembly. 3,724,505, Cl. 138-92.000.

Jahnke, Richard William, to Lubrizol Corporation, The. Photosensitive diacetone acrylamide resins. 3,725,231, Cl. 204-159.140.

Jakob, Franz: *See*—
Hanschke, Ernst; Fester, Walter; and Jakob, Franz, 3,725,478.

Jakubowski, Marek. High energy storage flywheel. 3,724,288, Cl. 74-572.000.

James, Michael Joseph, to Micro & Precision Mouldings (Cheltenham) Limited. Spring-biased latching detent. 3,724,888, Cl. 292-74.000.

Jamison, Saunders E., to Celanese Corporation. Terephthalic based unsaturated polyesters. 3,725,461, Cl. 260-475.00p.

Jan, Daniel: *See*—
Raess, Ulrich; and Jan, Daniel, 3,724,042.

Janiak, Stefan, to Ciba-Geigy AG. N-benzothiazol-2-yl-N'-propylureas. 3,725,428, Cl. 260-305.000.

Japanese Geon Company, Ltd., The: *See*—
Takeda, Masao; Iida, Eiichi; Komatsubara, Tsuneo; and Kagoshima, Yutaka, 3,725,325.
Ukita, Keizo; and Sadamori, Toshimasa, 3,725,492.

Japes, Manfred, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Aircraft loading ramps. 3,724,015, Cl. 14-71.000.

Jarosik, Robert J.: *See*—
Felcheck, Marvin; Kirschner, Wallace; Jarosik, Robert J.; and Capes, Charles W., 3,725,870.

Jasper Electronics Manufacturing Corporation, The: *See*—
Robinson, John W.; and Whittington, Billy Joe, 3,725,560.

Jasperson, Robert E.; and Kapland, Mitchell Arthur, to Trident Engineering Associates, Inc. Navigational chart display device. 3,724,079, Cl. 33-1.0sd.

Jaymar-Ruby, Inc.: *See*—
Ruby, Burton B., 3,723,993.

Jayne, Gerald John Joseph: *See*—
Elliott, John Scotchford; Crail, Ian Robert Henry; and Jayne, Gerald John Joseph, 3,725,434.

Jekl, Frantiek; Mateju, Vladimir; Pech, Josef; and Hrdina, Karel, to Vyzkumny ustav bavinarsky. Method of and apparatus for filling the shuttles with weft on progressive shed weaving looms. 3,724,508, Cl. 139-12.000.

Jenkins, Delbert G.: *See*—
Jenkins, Tobie W.; Jenkins, Delbert G.; and Jenkins, Dennis L., 3,724,472.

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Jenkins, Tobie W.; Jenkins, Delbert G.; and Jenkins, Dennis L., 3,724,472.

Jenkins, Gerald L.; Jungjohann, Vernon H.; Marvin, Edgar S.; and Seely, Neil G., to Eastman Kodak Company. Motion picture camera drive mechanism. 3,724,937, Cl. 352-140.000.

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Jenkner, Herbert, to Chemische Fabrik Kalk GmbH. Self-extinguishing polyurethanes containing brominated benzo-quinones. 3,725,316, Cl. 260-2.5aj.

Jennings, Harley Y., Jr., to Chevron Research Company. Blood flood. 3,724,546, Cl. 166-274.000.

Jennings, John D.: *See*—
Anderson, Albin R.; Jennings, John D.; and Killerby, Walter E., 3,724,739.

Jepsen, Tage L. B., to Basic Incorporated. Recovery of nickel concentrates from laterite ores. 3,725,039, Cl. 75-2.000.

Jernakoff, George: *See*—
Kydd, Paul H.; and Jernakoff, George, 3,724,261.

Jernigan, Thomas L., to Eskimo Pie Corporation. Extruder nozzle distribution plate with a plurality of valve controlled grooves. 3,724,984, Cl. 425-131.000.

Jet-X Corporation: *See*—
Proctor, Rudy R.; and Proctor, Denver L., 3,724,872.

Jetzt, John J.; and Sullivan, John Charles, to Bell Telephone Laboratories, Incorporated. Direct station selection private intercom exchange system. 3,725,601, Cl. 179-99.000.

Jimenez, Ivan: *See*—
Rubin, Irving N.; and Jimenez, Ivan, 3,724,800.

Jin, Jung, II: *See*—
Goswami, Jagadish C.; and Jin, Jung, II, 3,725,359.

Jocyno, Henry: *See*—
Schmick, Russell M.; and Jocyno, Henry, 3,725,648.

Johns, William H., to United States Steel Corporation. Collapsible gate for chain-link fence gateway. 3,724,527, Cl. 160-368.000.

Johns-Manville Corporation: *See*—
Gillberg, Carl Edward, 3,724,327.

Johnsen, Bernadou W., II: *See*—
Messerschmidt, Harold J.; Heyman, Karl; and Johnsen, Bernadou W., II, 3,725,159.
Messerschmidt, Harold J., Jr.; Heyman, Karl; and Johnsen, Bernadou W., II, 3,725,158.

Johnson & Johnson: *See*—
Fournier, Albert Anthony, 3,725,121.
Link, Martin, 3,724,651.
Weidner, Charles Leslie, 3,725,322.

Johnson, Axel R.; and Wolk, Ronald H., to Hydrocarbon Research, Inc. Hydrogenation of residuum. 3,725,247, Cl. 208-111.000.

Johnson, Clarence S. Universal replaceable weir assembly. 3,724,666, Cl. 210-169.000.

Johnson, Clarence S.; and Langguth, Arthur F., to United States of America, Navy. Method of making a protective diving suit. 3,725,173, Cl. 156-250.000.

Johnson, Derwyn C.: *See*—
Beaulieu, Alexandre J.; Fortin, Roger; Johnson, Derwyn C.; and Robinson, Alexander, 3,725,735.

Johnson, Douglas, to General Motors Corporation. Combustion apparatus. 3,724,207, Cl. 60-39.74r.
Johnson, Francis; and Nasutavicus, Wilmonte A., to Dow Chemical Company, The. Novel 3-amino-5-bromo-2H-1,4-thiazines. 3,725,401, Cl. 260-243.
Johnson, Frederick W.: *See*—
Gibson, David K.; and Johnson, Frederick W., 3,724,942.
Johnson, Herbert G. Heat exchanger with backed thin tubes. 3,724,537, Cl. 165-133.000.
Johnson, Justin O., Jr., to Honeywell Inc. Electrochemical oxygen demand apparatus. 3,725,236, Cl. 204-195.00r.
Johnson, Lennart B., to Teradyne, Inc. Bussing construction for printed circuit connectors. 3,725,843, Cl. 339-19.000.
Johnson, Matthey & Co., Limited: *See*—
Wilkinson, Geoffrey, 3,725,305.
Johnson, Ray M., to Microdry Corporation, mesne. Microwave applicator with throughput suppression guides at input and output ports. 3,725,628, Cl. 219-10.550.
Johnson, Roy A., to Mead Corporation, The. Synchronous cutter mechanism. 3,724,307, Cl. 83-337.000.
Johnson, Stanley R.; and Forel, Sheldon H., to Baxter Laboratories, Inc. Gel diffusion device. 3,725,004, Cl. 23-230.00b.
Johnston, Thomas F., Jr., to Lansing Research Corporation. Optical alignment device providing a virtual pivoting laser beam. 3,724,953, Cl. 356-153.000.
Jonas, Rochus: *See*—
Rogalski, Werner; Jonas, Rochus; Wahlig, Helmut; and Bergmann, Rolf, 3,725,390.
Jones, Darryl L.: *See*—
Hass, Robert H.; Mickelson, Grant A.; Baral, William J.; Reeg, Cloyd P.; Attane, Edward C., Jr.; and Jones, Darryl L., 3,725,243.
Jones, Eugene C.: *See*—
Northrop, John H.; Jones, Eugene C.; Sioles, George W.; and Mellette, Gary W., 3,724,860.
Jones, Howard: *See*—
Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzell, Bruce E., 3,725,548.
Jones, Ira David. Scope for viewing the internal surface of a bore of similar cavity. 3,724,922, Cl. 350-96.00r.
Jones, Jerry J.; and Lochridge, Joe C., to Brown & Root, Inc. Method and apparatus for plotting vessel position. 3,725,919, Cl. 343-6.50r.
Jones, Kenneth W.; and Richie, Edward H. Non-lethal home defense implement. 3,724,114, Cl. 42-84.000.
Jones, Robert D.: *See*—
Spector, Marshall L.; Jones, Robert D.; and McDowell, Curtis S., 3,725,258.
Jones, Robert D., to Air Products and Chemicals, Inc. Method of operating a variable flame oxy-fuel burner. 3,725,040, Cl. 75-60.000.
Jones, Ronald B. L., to Anaconda American Brass Company. Production of synthetic patina. 3,725,138, Cl. 148-6.140.
Jonsson, Carldavid, to Svenska Alucrom AB. System facilitating operations to be carried out on a ship's hull. 3,724,594, Cl. 182-36.000.
Joos, Bernhard. Hair and nail hardening process. 3,725,525, Cl. 424-61.000.
Jordan, John H., to Westinghouse Brake and Signal Company Limited. Selective control system for dispatching articles on a conveyor. 3,725,867, Cl. 340-172.500.
Jordan, Merrill E.; Burbine, William G.; and Williams, Frank R., to Cabot Corporation. Carbon black pigments. 3,725,103, Cl. 106-307.000.
Joseph, Michel Marie. Glass furnace. 3,725,558, Cl. 13-6.000.
Joseph, Robert T.: *See*—
Zanpirri, Anthony P.; Trechock, Jack; and Joseph, Robert T., 3,725,019.
Joseph, Robert T., to FMC Corporation. Form coke coated with glanz carbon and methods of production. 3,725,018, Cl. 44-10.00r.
Joseph, Robert T.; and Work, Josiah, to FMC Corporation. Method of producing carbon and iron-containing briquettes. 3,725,034, Cl. 75-4.000.
Joslyn Mfg. and Supply Co.: *See*—
Saccomano, Joseph M.; and Ellis, John D., Jr., 3,724,830.
Judd, Claude I.: *See*—
Skorcz, Joseph A.; Suh, John T.; and Judd, Claude I., 3,725,426.
Judd, Claude I.; and Hoya, Wallace K., to Colgate-Palmolive Company. Quinuclidylalkyl esters. 3,725,419, Cl. 260-293.530.
Julow, Thomas M., to Bendix Corporation, The. Rear seal for servomotor. 3,724,211, Cl. 60-54.60p.
Junggren, Ulf Krister: *See*—
Brandstrom, Arne Elof; Gustavii, Klas Ragnar; Junggren, Ulf Krister; and Kylberg, Kerstin, 3,725,006.
Jungjohann, Vernon H.: *See*—
Jenkins, Gerald L.; Jungjohann, Vernon H.; Marvin, Edgar S.; and Seely, Neil G., 3,724,937.
Junkinson, Anthony Richard: *See*—
Woodhead, James Louis; Dell, Ronald Michael; Junkinson, Anthony Richard; and Wilkinson, Raymond Westrop, 3,725,298.
Jurid Werke GmbH: *See*—
Popp, Franz; and Augustin, Wilfried, 3,725,334.
Just, Franklin H.: *See*—
Brunson, Glenn S.; Curran, Robert N.; and Just, Franklin H., 3,725,688.
Justice, James W. H., to Westinghouse Electric Corporation. Multiplex video transmission system. 3,725,571, Cl. 178-5.20r.
K-Tron Corporation: *See*—
Bullivant, Kenneth W., 3,724,720.
Kabel- und Metallwerke Gutehoffnungshutte: *See*—
Stenzel, Hans-Dieter, 3,725,162.
Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Staschewski, Alfred; Pflaum, Rudolf; and Martin, Helmut, 3,725,139.
Kabushiki Kaisha Ricoh: *See*—
Sugita, Keiji; Mochimaru, Hideaki; and Watanabe, Toshio, 3,724,944.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Tanasawa, Yasusi; Inoue, Tokuta; and Ishiguro, Kenji, 3,724,220.
Kachler, Robert S. Wheel cover assembly. 3,724,905, Cl. 301-37.00p.
Kaczeus, Steven L., to Printer Technology Inc. Printer with helically arranged type divided into axially offset group. 3,724,631, Cl. 197-49.000.
Kaesemeyer, Carl W., to Cincinnati Milacron Inc. Hydraulic actuator with arcuate expansible chambers. 3,724,335, Cl. 92-66.000.
Kagoshima, Yutaka: *See*—
Takeda, Masao; Iida, Eiichi; Komatsubara, Tsuneo; and Kagoshima, Yutaka, 3,725,325.
Kahle Aktiengesellschaft: *See*—
Seifried, Walter; and Klenk, Ludwig, 3,725,519.
Kaiser, Ado: *See*—
Bretschneider, Hermann; Kaiser, Ado; and Hohenlohe-Oehringen, Kraft, 3,725,470.
Kaiser Aluminum & Chemical Corporation: *See*—
Pearson, Michael J.; Olsen, Orrie C.; and Murphy, James F., 3,725,531.
Kaiser, Paul: *See*—
Sudribin, Leon P.; and Kaiser, Paul, 3,725,225.
Kajan Specialty Company, Inc.: *See*—
Roberts, Preston C., 3,724,576.
Kali-Chemie Aktiengesellschaft: *See*—
Paucksch, Heinrich; Massonne, Joachim; Bohm, Horst; and Fernschild, Gunter, 3,725,475.
Kalin, Sumner H.: *See*—
Alworth, Harry M.; and Kalin, Sumner H., 3,725,143.
Kalle Aktiengesellschaft: *See*—
Luders, Walter; Steppan, Hartmut; and Klupfel, Kurt-Walter, 3,725,356.
Rassbach, Felix; and Buttner, Rolf, 3,724,030.
Kalt, Bryson R. Protective pad for furniture articles. 3,725,188, Cl. 161-116.000.
Kamata, Eitaro, to Shoei Kakoh Co., Ltd. Substantially double-shell helmet. 3,723,992, Cl. 2-3.00r.
Kamezawa, Yasutoki: *See*—
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,725,066.
Kamienski, Conrad W.: *See*—
Morrison, Robert C.; and Kamienski, Conrad W., 3,725,368.
Kaminaka, Hiroshi: *See*—
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.
Kaminski, William: *See*—
Brown, Earl Franklin; and Kaminski, William, 3,725,578.
Kanai, Kazumichi: *See*—
Otsuka, Eiji; Kanai, Kazumichi; Inoue, Shigeru; and Hashimoto, Novuyoshi, 3,725,210.
Kane and Sullivan Inc.: *See*—
Kane, Leslie, 3,724,080.
Kane, Leslie, to Kane and Sullivan Inc. Ellipse compass. 3,724,080, Cl. 33-30.00d.
Kanegafuchi Boseki Kabushiki Kaisha: *See*—
Ando, Satoshi; Matsui, Masao; and Ogata, Fumimaro, 3,725,192.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Watanabe, Kiyoshi; Shimada, Yoshio; Kawaharada, Hajime; Suzuki, Kenji; and Tanaka, Fumio, 3,725,200.
Kaneko, Takashi: *See*—
Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Mukai, Takuma; Nakazima, Atushi; and Sakunaga, Kenichi, 3,724,038.
Kani, Hiyama: *See*—
Yamamura, Toshio; Omote, Yuichi; Sato, Shiro; and Kani, Hiyama, 3,725,527.
Kanno, Tadaaki; and Iwamoto, Minoru, to Ricoh Co., Ltd. Electrophotographic copying apparatus provided with an automatic elevational original keep-plate. 3,724,949, Cl. 355-75.000.
Kanto Denka Kogyo Co., Ltd.: *See*—
Yamamura, Toshio; Omote, Yuichi; Sato, Shiro; and Kani, Hiyama, 3,725,527.
Kaplan, Irving Leonard, to Skijor Manufacturing Company. Ski especially adapted for use by skiers towed by a snowmobile or the like. 3,724,866, Cl. 280-11.13w.
Kapland, Mitchell Arthur: *See*—
Jasperson, Robert E.; and Kapland, Mitchell Arthur, 3,724,079.
Karch, Ludwig, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Apparatus for electromagnetic suspension and guidance of tracked cars. 3,724,388, Cl. 104-148.0ms.
Karel, Ernst Klatte. Bandaging means. 3,724,457, Cl. 128-171.000.
Karlin, George H.: *See*—

Elson, Edward E.; McQuary, Kenneth L.; Karlin, George H.; and Lane, Bert, 3,724,516.

Kasin, Hans; and Thvedt, Krane, to Christiania Spigerverk. Suspension for pivotal track frames on terrain motor vehicles. 3,724,587, Cl. 180-9.540.

Kaspers, Helmut: *See*—
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, 3,725,549.

Katagiri, Takeo; Hiromori, Kunio; Yoshimura, Shoichiro; Suda, Kazuyoshi; and Tanaka, Jinichi, to Switching device for delivering sheet-like articles. . 3,724,657, Cl. 209-74.000.

Katakura, Keiji: *See*—
Imamura, Hitoshi; and Katakura, Keiji, 3,724,740.

Katamoto, Kazuyoshi: *See*—
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Yamazaki, Osami; and Fukudi, Hideo, 3,725,474.

Kataoka, Seiichi: *See*—
Ando, Tadanao; Kataoka, Seiichi; and Shiihara, Isao, 3,725,347.

Kato, Masumi: *See*—
Shirai, Takeaki; Kato, Masumi; and Oshikawa, Kiyomitsu, 3,724,133.

Katsaros, James. Safety lock. 3,724,246, Cl. 70-431.000.

Kaufman, Martin H., to United States of America, Navy. Mixing process and extrusion of solid propellants. 3,725,516, Cl. 264-3.00b.

Kaufmann, Albert R., to Whittaker Corporation. Powder production by gas atomization of liquid metal. 3,725,517, Cl. 264-12.000.

Kautz, William H., to United States of America, Navy. Cellular correlation array. 3,725,689, Cl. 235-181.000.

Kavepa, Alexandr Alexandrovich; Nitkovskikh, Anatoly Anatolievich; Grigoriev, Vladimir Andreevich; Pashkov, Arkady Borisovich; and Epshtein, Yakov Vulfovich, to Proektno-Konstruktorskoe Bjuro po Proektirovani ju Oborudovania dlya Proizvodstva Plasticheskik Mass i ulitsa Kalinima. Multisection apparatus with conveying means for carrying out mass-exchange processes in solid-liquid systems. 3,725,013, Cl. 23-285.000.

Kavthekar, Keshav S.; and Somers, Jess J., to Ford Motor Company. Integrated air distribution system. 3,724,357, Cl. 98-2.110.

Kawaharada, Hajime: *See*—
Watanabe, Kiyoshi; Shimada, Yoshio; Kawaharada, Hajime; Suzuki, Kenji; and Tanaka, Fumio, 3,725,200.

Kawai, Hisasi: *See*—
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, 3,724,293.
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, 3,724,295.

Kawai, Tadashi; and Kenma, Hideaki, to Mitsui Mining & Smelting Co., Ltd. Method for segregating metals contained in the oxide ores thereof. 3,725,043, Cl. 75-72.000.

Kawamoto, Susumu; and Suzuki, Hisao, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Method for testing radiator-tube-clogging property of anti-freezing coolants. 3,725,212, Cl. 204-1.00t.

Kawano, Akira; Sakakibara, Kozo; Abe, Iwao; and Chonan, Takayuki, to Daicel Ltd. Process for preparing α~β-unsaturated carboxylic unsaturated carboxylic acids. 3,725,472, Cl. 1-15-73.

Kawano, Suminsri: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.

Kawase, Butaro; Kojima, Iwao; and Otani, Kunio, to Showa Denko K.K. Method of removing mercury vapor from gases. 3,725,530, Cl. 423-210.000.

Kawashima, Hideo: *See*—
Miyadera, Yasuo; Masuko, Tatuo; Muroi, Tadashi; Noguchi, Hiroshi; and Kawashima, Hideo, 3,725,344.

Kawashima, Yoshichi: *See*—
Muto, Katsuya; and Kawashima, Yoshichi, 3,724,230.

Kay, Robert C., to International Business Machines Corporation. Equipment enclosure. 3,724,702, Cl. 220-4.00f.

Kaye, Linda: *See*—
Hicks, Hjalmar L., 3,724,025.

Kaywood Products Corporation: *See*—
Kaywood, Roy H.; Kaywood, Roy G.; and Clayton, Keith P., 3,724,151.

Kaywood, Roy G.: *See*—
Kaywood, Roy H.; Kaywood, Roy G.; and Clayton, Keith P., 3,724,151.

Kaywood, Roy H.; Kaywood, Roy G.; and Clayton, Keith P., to Kaywood Products Corporation. Mobile home anchor. 3,724,151, Cl. 52-295.000.

Kazan, Benjamin, to International Business Machines Corporation. Self-scanning plasma display device with phosphor screen. 3,725,731, Cl. 315-169.00r.

Kearney & Trecker Corporation: *See*—
Lane, Kenneth H., 3,725,634.

Keech, Eugene E.: *See*—
Hager, George S.; Keech, Eugene E.; and Dossett, Lawrence S., 3,724,772.

Keenan, William F.: *See*—
Balogh, Edward, Jr.; Bennett, James Russell; Keenan, William F.; Logan, William A.; and Murphy, John S., 3,725,872.

Kefalas, John H.; and Lukianov, Roman E., to Honeywell Inc. Memory element and configuration. 3,725,882, Cl. 340-174.00m.

Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R., & Co. High energy curable liquid polyene-polythiol polymer composition. 3,725,228, Cl. 204-159.140.

Kehr, Clifton L.; and Waszolek, Walter R., to Grace, W. R., & Co. High energy curable liquid polyene-polythiol polymer composition. 3,725,229, Cl. 204-159.140.

Keig, George A.; Smith, James C.; and Watts, John M. J., to Union Carbide Corporation. Asteriated synthetic corundum gem stones. 3,725,092, Cl. 106-42.000.

Keil, Ronald B., to General Motors Corporation. Self contained memory keyboard. 3,725,877, Cl. 340-172.500.

Keister, Frank Z.; and Rust, John B., to United States of America, Navy. Pyrotechnic eradication of microcircuits. 3,725,671, Cl. 307-202.000.

Kelleher, Michael J. Modular units, buildings and systems. 3,724,141, Cl. 52-79.000.

Kellogg, James R., to Tektronix, Inc. Jitter-free trigger control circuit. 3,725,792, Cl. 328-60.000.

Kelly, John, Jr., to Mobil Oil Corporation. Method of controlling lost circulation. 3,724,565, Cl. 175-72.000.

Kemp, Thomas, to Produits Chemiques Pechiney-Saint-Gobain. Preparation with seeding of polymers insoluble in their monomeric compositions. 3,725,367, Cl. 260-80.810.

Kemper, Jurgen; and Schenk, Erwin, to Siemens Aktiengesellschaft. Process and circuit arrangement for the measuring of the frequency of bit errors and block errors with optional block length in the transmission of binary coded data characters. 3,725,860, C. 340-146.1ax.

Kendall, Don Leslie. Individual device tuning using localized solid-state reactions. 3,725,148, Cl. 148-186.000.

Kendall, Earl W., to Rohr Industries, Inc. Composition for electrolytic descaling of titanium and its alloys. 3,725,224, Cl. 204-141.500.

Kenma, Hideaki: *See*—
Kawai, Tadashi; and Kenma, Hideaki, 3,725,043.

Kennedy, Peter D.: *See*—
Murphree, Francis J.; Kennedy, Peter D.; and Webster, Richard B., 3,725,855.

Kenney, Edward J.: *See*—
Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., 3,725,473.

Kennicutt, Robert B., to Caterpillar Tractor Company. Limited slip differential with clutch control means. 3,724,289, Cl. 74-711.000.

Kerridge, Mark L.: *See*—
Putnam, Allen Lewis, 3,724,119.

Kerst, Al Fred: *See*—
Douros, John D., Jr.; and Kerst, Al Fred, 3,725,557.

Kesling, Peter C. Universal tooth positioning and retaining appliance. 3,724,075, Cl. 32-14.00b.

Kessler, Richard B.; and Nobel, Fred I., to Lea-Ronal, Inc. Electrodeposition of copper from acidic baths. 3,725,220, Cl. 204-52.00r.

Ketcham & McDougall, Inc.: *See*—
Bosland, James M., 3,724,766.

Keunecke, Gerhard: *See*—
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert, 3,725,211.

Kieninger & Oberfell, Firma: *See*—
Donner, Siegmar, 3,724,200.

Kieninger and Obergfell: *See*—
Voland, Dieter; and Scheer, Erich, 3,725,618.

Kihlstedt, Per Gudmar, to AB Cold Bound Pellets. Method for agglomerating ore concentrate and resultant product. 3,725,032, Cl. 75-3.000.

Kihlstedt, Per Gudmar, to AB Cold Bound Pellets. Agglomerating moist particulate material by adjusting the zeta-potential to zero. 3,725,033, Cl. 75-3.000.

Kikuchi, Michio: *See*—
Masumoto, Hakaru; Sawaya, Shohachi; and Kikuchi, Michio, 3,725,052.

Killebrew, Inc.: *See*—
Dahl, Rulon R., 3,724,058.

Killerby, Walter E.: *See*—
Anderson, Albin R.; Jennings, John D.; and Killerby, Walter E., 3,724,739.

Kilmer, Charlie C.; and Orchard, Robert J., to International Business Machines Corporation. Acoustic coupler. 3,725,584, Cl. 179-1.00c.

Kilmer, Dan L.: *See*—
Cox, Robert M.; Crowley, Ernest W.; and Kilmer, Dan L., 3,724,485.

Kim, Charles W., to Hercules Incorporated. Method for preparing spun yarns. 3,724,198, Cl. 57-140.00r.

Kim, Dong H.: *See*—
Santilli, Arthur A.; and Kim, Dong H., 3,725,405.

Kimberly-Clark Corporation: *See*—
Appel, David W.; and Hong, Sung Ho, 3,724,094.
Beckstrom, Daniel H., 3,724,266.
Duchane, David V., 3,724,465.
Enloe, Kenneth M., 3,724,464.
Hanke, David E., 3,724,462.

Kimura, Akio: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.

Kinberg, Benjamin; and Mayer, Richard J. Music box. 3,724,316, Cl. 84-95.000.

King, Kenneth Gordon, to Westinghouse Brake and Signal Company Limited. Fail-safe lamp filament monitoring circuit. 3,725,728, Cl. 315-65.000.

Kinoshita, Kunihiko: *See—*
Suzuki, Seiya; Mizuhata, Yasuo; Kinoshita, Kunihiko; and Godo, Takanobu, 3,725,391.

Kinoshita, Yukio: *See—*
Oushige, Takayoshi; Kinoshita, Yukio; Iizuka, Kikuo; and Nishimiya, Yutaka, 3,725,808.

Kinsella, Richard I.: *See—*
Lorenzini, Raymond; and Kinsella, Richard I., 3,724,162.

Kiovsky, Thomas E.; and Wald, Milton M., to Shell Oil Company. Hydrogenation catalyst and process. 3,725,239, Cl. 208-10.000.

Kirchdorf, Josef, to Ghielmetti AG. Multi-contact data module having a connection matrix and a switching body and actuator plug template. 3,725,621, Cl. 200-46.000.

Kircher, Charles E., Jr.: *See—*
McCracken, William L.; Petering, Wilbur H.; Kircher, Charles E., Jr.; and Pinchak, Paul R., 3,725,486.

Kirschner, Wallace: *See—*
Felcheck, Marvin; Kirschner, Wallace; Jarosik, Robert J.; and Capes, Charles W., 3,725,870.

Kisling, James W., III, to Schlumberger Technology Corporation. Low flow safety valve. 3,724,493, Cl. 137-459.000.

Kiss, Emil P.; Onyx, Raymond C.; and Fegley, Richard F., to Paco Winders, Inc. Tube labeling and cutting machine. 3,725,179, Cl. 156-448.000.

Kitano, Akira: *See—*
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, 3,724,293.
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, 3,724,295.

Kitazawa, Yoriya: *See—*
Arakawa, Takaai; Saeki, Kenji; Sato, Yoshikuni; and Kitazawa, Yoriya, 3,725,497.

Kitchen, Ruben P., Jr. Ignition lock. 3,724,245, Cl. 70-431.000.

Kito, Masahiro: *See—*
Kobashi, Uichiro; and Kito, Masahiro, 3,724,210.

Kittell, Frank J.: *See—*
Revell, Donald H.; and Kittell, Frank J., 3,724,253.

Kitzner, Ernest W.; Rhodes, Alex; and Rose, James, to Ford Motor Company. Energy absorbing steering column assembly. 3,724,286, Cl. 74-492.000.

Kleemann, Manfred: *See—*
Grell, Wolfgang; Griss, Gerhart; and Kleemann, Manfred, 3,725,388.

Kleiber, Armin; and Schmidt, Wilfred. Slab casting apparatus. 3,724,805, Cl. 249-171.000.

Klein, Peter, to Siemens Aktiengesellschaft. Apparatus for a telephone exchange system with conference equipment and having a video capability. 3,725,587, Cl. 179-2.0tv.

Klein, Wilfred: *See—*
Nevyas, Herbert J.; and Klein, Wilfred, 3,724,931.

Kleiner, Hans-Jerg: *See—*
Schimmelschmidtq Kurt; and Kleiner, Hans-Jerg, 3,725,515.

Kleiner, Hans-Jerg, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of 2-chlorethanephosphonic acid dichloride. 3,725,227, Cl. 204-158.0ha.

Kleiner, Walter, to Staubli Ltd. Dobby. 3,724,510, Cl. 139-66.00r.

Kleiner, Walter, to Staubli Ltd. Device for controlling a wedge coupling, particularly in a dobby. 3,724,511, Cl. 139-66.00r.

Klenk, Ludwig: *See—*
Seifried, Walter; and Klenk, Ludwig, 3,725,519.

Kleykamp, Donald L.; Gaster, Ivan; Browning, Vernon D.; and Holden, Homer N., to Dayco Corporation. Continuously manufactured flexible conduit. 3,724,507, Cl. 138-122.000.

Kleykamp, Donald L.; Gaster, Ivan; Browning, Vernon D.; and Holden, Homer N. Continuously manufactured flexible conduit. 3,725,178, Cl. 156-393.000.

Kliewer, George G.; Kliewer, Steven L.; and Kliewer, Michael G., to Dun-Rite Manufacturing Corporation. Thermal indicator. 3,724,360, Cl. 99-342.000.

Kliewer, Michael G.: *See—*
Kliewer, George G.; Kliewer, Steven L.; and Kliewer, Michael G., 3,724,360.

Kliewer, Steven L.: *See—*
Kliewer, George G.; Kliewer, Steven L.; and Kliewer, Michael G., 3,724,360.

Klimchak, Edward George; and Rosenbaum, Erik, to Bendix Corporation, The. Digitally controlled weight adjustment system. 3,725,928, Cl. 343-55.00a.

Klockner-Werke Aktiengesellschaft: *See—*
Asbeck, Werner; and Wilkening, Hermann, 3,724,249.

Klupfel, Kurt-Walter: *See—*
Luders, Walter; Steppan, Hartmut; and Klupfel, Kurt-Walter, 3,725,356.

Kmecak, Ronald A.; and Kovach, Stephen M., to Ishland Oil, Inc. Hydrogen production and utilization. 3,725,246, Cl. 208-100.000.

Knaggs, Edward Andrew: *See—*
Nelson, Douglas Carlyle; and Knaggs, Edward Andrew, 3,725,290.

Knapp, Lester L.: *See—*
Russell, Allen S.; Knapp, Lester L.; and Haupin, Warren E., 3,725,222.

Knapp, Walter; and Schneider, Othmar, to Agfa-Gevaert Aktiengesellschaft. Photographic printing arrangement. 3,724,946, Cl. 355-36.000.

Knecht, Adolf: *See—*
Hanssen, Dieter; and Knecht, Adolf, 3,725,556.

Knecht, Walter L. Method for repairing flooring construction. 3,724,158, Cl. 52-743.000.

Knight, Bruce L., to Marathon Oil Company. Economical mobility control in oil recovery processes. 3,724,545, Cl. 166-273.000.

Knight, Howard Richard James, to Carrier Engineering Company Limited. Controlling spray guns. 3,724,415, Cl. 118-2.000.

Knight, Lee Ayers: *See—*
Knight, Randolph Bentley; and Knight, Lee Ayers, 3,724,378.

Knight, Randolph Bentley; and Knight, Lee Ayers. Shot concentrator. 3,724,378, Cl. 102-42.00c.

Knott, Edward B.: *See—*
Bailey, Joseph; Knott, Edward B.; and Marr, Peter A., 3,725,067.

Knox, Inc.: *See—*
Callan, John G., 3,724,958.

Knudsen, Bent: *See—*
Knudsen, Kai; and Knudsen, Bent, 3,724,491.

Knudsen, Kai; and Knudsen, Bent. Removable valve insulation and cover. 3,724,491, Cl. 137-375.000.

Knudsen, William C. Bubble pulse suppression with acoustic source optimization. 3,724,590, Cl. 181-.5xc.

Kobald, Walter, to Bosch, Robert, G.m.b.H. Hydraulic braking apparatus. 3,724,609, Cl. 188-170.000.

Kobashi, Uichiro; and Kito, Masahiro, to Aisin Seiki Kabushiki Kaisha. Push rod mechanism for parallel cylinders. 3,724,210, Cl. 60-54.60e.

Kobayashi, Akiyoshi, to Toyoda Koki Kabushiki Kaisha. Feed mechanism for machine tool. 3,724,331, Cl. 91-407.000.

Kobayashi, Nobuki: *See—*
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.

Kobayashi, Teruo: *See—*
Horiie, Shigeki; Morikawa, Hiroyasu; Fujii, Chiyuki; Kobayashi, Teruo; Kohno, Susumu; and Ono, Toru, 3,725,443.

Kobayashi, Toyoaki, to Aisin Seiki Kabushiki Kaisha. Disk brake assembly. 3,724,606, Cl. 188-72.500.

Kobe Steel, Ltd.: *See—*
Narita, Kiichi; Mori, Takasuke; and Itoo, Takamichi, 3,724,528.

Kobel, Erwin H.: *See—*
Smith, Harry A.; and Kobel, Erwin H., 3,725,349.

Kobelt, Jack R. Apparatus for automatic pitch compensation in marine vessels. 3,724,970, Cl. 416-27.000.

Kobler, Richard; Fagan, William F.; and Feldman, Edward, to McGraw-Edison Company. Cassette magnetic tape recorder. 3,724,859, Cl. 274-4.00d.

Kobylinski, Tadeusz P.; and Swift, Harold E., to Gulf Research & Development Company. Olefin disproportionition process. 3,725,496, Cl. 260-683.00d.

Koepke, Horst, to Mindrill Limited. Core drill latch. 3,724,568, Cl. 175-246.000.

Koerner, Gotz; Kropac, Vaclav; and Gerd, Rossmy, to Goldschmidt, Th., AG. Process of reacting a halogen-silane mixture with an alcohol mixture containing a tertiary alcohol. 3,725,339, Cl. 260-46.50r.

Koh-I-Noor Rapidograph, Inc.: *See—*
Anderka, Gerold, 3,724,676.

Kohl, Karl. Jacquard mechanism. 3,724,512, Cl. 139-85.000.

Kohl, Robert E., to Diebold Incorporated. Tapered roll conveyor curve construction. 3,724,643, Cl. 198-127.00r.

Kohler Co.: *See—*
Povalski, Eugene A.; and Bolgert, Edwin F., 3,724,480.

Kohn, Mitchell I.: *See—*
Alton, Ahdor H.; and Kohn, Mitchell I., 3,725,783.

Kohno, Susumu: *See—*
Horiie, Shigeki; Morikawa, Hiroyasu; Fujii, Chiyuki; Kobayashi, Teruo; Kohno, Susumu; and Ono, Toru, 3,725,443.

Koizumi, Yutaka, to Ricoh Co., Ltd. Electrophotographic copying apparatus with means for erasing marginal images. 3,724,940, Cl. 355-3.00r.

Kojima, Iwao: *See—*
Kawase, Butaro; Kojima, Iwao; and Otani, Kunio, 3,725,530.

Kojima, Kiyoshi; and Abe, Toshiro, to Matsushita Denko Kabushiki Kaisha. Photosensitive solid oscillator. 3,725,820, Cl. 331-107.00r.

Koleske, Joseph Victor; Roberts, Rene Marie-Joseph; and Del Giudice, Frank Paul, to Union Carbide Corporation. ABA block polymers of polyesters and polyethers. 3,725,352, Cl. 260-75.00r.

Kolesova, Alvina Grigorievna: *See—*
Roizin, Natan Moiseevich; Larionav, Igor Naumovich; and Kolesova, Alvina Grigorievna, 3,725,147.

Kolman, John L., to United States Manufacturing Company. Prosthetic leg with weight responsive knee lock. 3,723,997, Cl. 3-27.000.

Komatsubara, Tsuneo: *See—*
Takeda, Masao; Iida, Eiichi; Komatsubara, Tsuneo; and Kagoshima, Yutaka, 3,725,325.

Komp, Richard J., to Xerox Corporation. Method of cleaning an electrostatographic imaging surface. 3,725,059, Cl. 96-1.400.

Kompfner, Rudolf: *See—*
Ashkin, Arthur; Ippen, Erich Peter; and Kompfner, Rudolf, 3,725,810.

Kondo, Kazuyoshi. Precision shearing method. 3,724,305, Cl. 83-14.000.

Kondo, Tokiharu: *See*—
Shiba, Keisuke; Hinata, Masanao; Yamasue, Koutaro; and Kondo, Tokiharu, 3,725,074.

Konig, Wolfgang; and Geiger, Rolf, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Method of synthesizing peptides in the presence of a carbodiimide and a 1-hydroxybenzotriazole. 3,725,380, Cl. 260-112.500.

Konopka, Edward Alexander; and Gelzer, Justus Melchior, to Ciba-Geigy Corporation. Synergistic antibiotics. 3,725,543, Cl. 424-114.000.

Konvalina, John, to Houdaille Industries, Inc. Computer controlled machine tool system with stored micro language program for effecting pattern type punching operations. 3,725,652, Cl. 235-151.110.

Kooistra, John A., to Procter & Gamble Company, The. Synergistic antibacterial combination. 3,725,547, Cl. 24-245.000.

Koppen, Gerhard; Dobring, Wilfried; and Siebart, Manfred, to Siemens Aktiengesellschaft. Measuring resistance device for high voltage. 3,725,839, Cl. 338-334.000.

Koppers Company, Inc.: *See*—
Calistrat, Michael M., 3,724,239.
Fekete, Frank; Pulman, Leonard J.; and Thrash, David J., 3,725,172.

Korb, Frank J.; and Schaefer, John O., to International Business Machines Corporation. Feed system for an adhesive ribbon or the like. 3,724,633, Cl. 197-151.000.

Kordas, Martin W.; May, Robert C.; and Scanlon, John J., to Remington Arms Company, Inc. Expendable case shotshell. 3,724,376, Cl. 102-42.000.

Kornylak, Andrew T., to Kornylak Corporation. Endless belt conveyor. 3,724,646, Cl. 198-201.000.

Kornylak Corporation: *See*—
Kornylak, Andrew T., 3,724,646.

Kosakowski, Henry R., to Bendix Corporation, The. Self-calibrating analog to digital converter. 3,725,903, Cl. 340-347.0ad.

Koshimoto, Shinsuke: *See*—
Fujimoto, Yasuo; Masumura, Isao; Tatsukawa, Keizo; Koshimoto, Shinsuke; and Doiuchi, Toru, 3,725,353.

Kotera, Norio: *See*—
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.

Kouchi, Toshihiro: *See*—
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,725,066.

Koulicovitch, Maurice, to Societe Genevoise d'Instruments de Physique. High precision photoelectric microscope for reading the mark of a precision ruler. 3,724,959, Cl. 356-170.000.

Kovach, Stephen M.: *See*—
Kmecak, Ronald A.; and Kovach, Stephen M., 3,725,246.

Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant thermoplastic polymer compositions of a methyl methacrylate polymer with a copolymer of a halogenated ethylenically unsaturated monomer and a phosphorus containing vinyl monmer. 3,725,509, Cl. 260-899.000.

Kraisel, August: *See*—
Ellwanger, Hans; Kraisel, August; Kraus, Walter; and Zirps, Wilhelm, 3,724,003.

Kral, Erwin F.; and Eschrich, Dieter, to VEB Jenapharm. Test tube for the quantitative detection of the alcoholic strength of respiratory air and method for the preparation of said tube. 3,725,007, Cl. 23-254.00r.

Kramer, George M., to Esso Research and Engineering Company. Catalyst mixture of aluminum halo bromide and sulfur oxy halide and its use in isomerization. 3,725,500, Cl. 260-683.680.

Kramer, Sheldon J.: *See*—
Carr, Norman L.; Kramer, Sheldon J.; and Stahlfeld, Donald L., 3,725,653.

Kramer, Walter W., to Fuller Company. Gate valve. 3,724,490, Cl. 137-340.000.

Krapcho, John, to Squibb, E. R., & Sons, Inc. Benzothiazine derivatives. 3,725,403, Cl. 260-243.00r.

Kraus, Walter: *See*—
Ellwanger, Hans; Kraisel, August; Kraus, Walter; and Zirps, Wilhelm, 3,724,003.

Krause Milling Company: *See*—
Cummisford, Robert G., 3,725,324.

Krejdirik, Libor: *See*—
Serbus, Ctibor; Rezac, Jan; Pribil, Stanislav; Marvan, Petr; Krejdirik, Libor; and Stoy, Artur, 3,725,291.

Krikorian, Albert P., to National Blank Book Company, Inc. Loose leaf ring binder easel structure. 3,724,876, Cl. 281-33.000.

Krimphove, Herbert: *See*—
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert, 3,725,211.

Krock, Elmer W.; and Simon, Charles J., to GTE Automatic Electric Laboratories Incorporated. Call pickup service for PABX telephone system. 3,725,599, Cl. 179-18.0bd.

Kroetch, Arthur A. Tube bender and cutter. 3,724,256, Cl. 72-332.000.

Kropac, Vaclav: *See*—
Koerner, Gotz; Kropac, Vaclav; and Gerd, Rossmy, 3,725,339.

Kropp, John L.: *See*—
Stanley, Charles C.; and Kropp, John L., 3,725,658.

Krow, Cecil J. Spark plug. 3,725,715, Cl. 313-131.000.

Krumm, Eugene D., to Air Preheater Company Inc., The. Controls for incinerator. 3,724,401, Cl. 110-8.00r.

Kruse, Marvin A., to Littlefuse, Inc. Waterproof door-operated switch assembly. 3,725,626, Cl. 200-168.00g.

Kubota, Yasuharu: *See*—
Kurikawa, Hiromichi; and Kubota, Yasuharu, 3,725,572.

Kubotera, Haruo; Nakaoka, Kazuhide; Araki, Kenji; and Kurihara, Takao, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for water quenching metal strips. 3,724,826, Cl. 266-3.00r.

Kuch, Heinz; Schmitt, Karl; Seidl, Gunther; and Hoffmann, Irmgard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 2-Amino-4,4-di-substituted-4H-3,1-benzoxazines. 3,725,404, Cl. 260-244.00r.

Kuckhermann, Gustav, to Windmoller & Holscher. Stacking apparatus for sheet articles fed in overlapping formation on a continuously moving conveyor towards a stacking station. 3,724,840, Cl. 271-46.000.

Kuffner, Karl; and Proeschel, Ernst, to Agfa-Gevaert Aktiengesellschaft. Silver halide emulsions stabilized with nitroso derivatives of phenols. 3,725,077, Cl. 96-109.000.

Kuhne, Rudolf; Hamal, Heinrich; and Thilenius, Thilo, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Monoazo pigment mixtures and process for their preparation. 3,725,101, Cl. 106-288.00q.

Kuhnlein, Dieter; Emmert, Reinhold; and Haag, Georg, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Inh. Max Grundig. Operating apparatus for a cartridge tape recorder. 3,724,778, Cl. 242-198.000.

Kulicke and Soffa Industries, Inc.: *See*—
Angelucci, Thomas L.; Angelucci, Joseph L.; and Vilenski, Dan, 3,725,631.

Kulka, Marshall: *See*—
Harrison, William A.; and Kulka, Marshall, 3,725,427.

Kumurdjian, Pierre: *See*—
Bourgoin, Gerard; Kumurdjian, Pierre; Loitiere, Alain; and Pere, Jean-Francois, 3,725,685.

Kunde, Joachim; Ramlow, Gerhard; Buechler, Guenter; Pohlemann, Heinz; and Hendus, Hans, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Polyamides with dispersed oxyalkyated grafted polyamides. 3,725,503, Cl. 260-857.0tw.

Kunz, Raymond W., to General Electric Company. Electric fan heater. 3,725,640, Cl. 219-370.000.

Kuper, Alan B. Oxidation of semiconductive alloys and produce obtained thereby. 3,725,161, Cl. 156-17.000.

Kupfer, Hanspeter; and Hossmann, Marcel, to Albiswerk Zurich AG. Distance measuring method and apparatus for the performance thereof utilizing two transmitter-receiver devices. 3,725,920, Cl. 343-6.50r.

Kupsky, George A., to Burroughs Corporation. Multi-position gaseous discharge display panel. 3,725,713, Cl. 313-108.00r.

Kuramochi, Shigeaki, to Marx, Louis, & Co., Inc., mesne. Typewriter. 3,724,632, Cl. 197-85.000.

Kurihara, Takao: *See*—
Kubotera, Haruo; Nakaoka, Kazuhide; Araki, Kenji; and Kurihara, Takao, 3,724,826.

Kurikawa, Hiromichi; and Kubota, Yasuharu, to Sony Corporation. Color television camera. 3,725,572, Cl. 178-5.4st.

Kurokawa, Isao; Kzawa, Nobuyuki; and Orita, Shunji, to Asahi Kasei Kogyo Kabushiki Kaisha. Gas-producing device for an inflatable body-protecting bag on a high-speed vehicle. 3,724,870, Cl. 280-150.0ab.

Kurozumi, Seizi: *See*—
Nagahama, Shizuo; Shimada, Keizo; and Kurozumi, Seizi, 3,725,490.

Kuruma, Hiroshi: *See*—
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.

Kurz, Anton: *See*—
Dahl, Hans; and Kurz, Anton, 3,725,197.

Kusan, Inc.: *See*—
Foley, Charles F.; McCarthy, Charles D.; and Hardin, Charles H., 3,724,124.

Kushmuk, Walter P.: *See*—
Hutchinson, William Y.; and Kushmuk, Walter P., 3,724,574.

Kuss, R. L., & Co., Inc.: *See*—
Kuss, Ralph L., 3,724,007.

Kuss, Ralph L., to Kuss, R. L., & Co., Inc. Adjustable support for a water mattress. 3,724,007, Cl. 5-236.000.

Kuster, Karl H., to GTE Automatic Electric Laboratories Incorporated. Voltage margining control circuit for program controlled power supplies. 3,725,740, Cl. 317-16.000.

Kutsay, Ali Umit. Force detecting and evaluating apparatus. 3,724,575, Cl. 177-211.000.

Kuwabara, Jun, to Atomic Power Development Associates, Inc. Metering apparatus for nuclear reactors. 3,724,268, Cl. 73-194.0em.

Kuwahara, Hirosi: *See*—
Suyama, Fujio; Yamamoto, Tokuo; Shimono, Kenichi; Kuwahara, Hirosi; Ishii, Masao; and Watanabe, Ichiro, 3,725,195.

Kydd, Paul H.; and Jernakoff, George, to General Electric Company. Device for measuring heat release in continuous calorimeter. 3,724,261, Cl. 73-190.00r.

Kylberg, Kerstin: *See—*
Brandstrom, Arne Elof; Gustavii, Klas Ragnar; Junggren, Ulf Krister; and Kylberg, Kerstin, 3,725,006.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Fujimoto, Yasuo; Masumura, Isao; Tatsukawa, Keizo; Koshimoto, Shinsuke; and Doiuchi, Toru, 3,725,353.

Kzawa, Nobuyuki: *See—*
Kurokawa, Isao; Kzawa, Nobuyuki; and Orita, Shunji, 3,724,870.

La Cellopane: *See—*
Weber, Guy, 3,724,028.

La Croix, Robert E.: *See—*
Schumacher, Berthold W.; and La Croix, Robert E., 3,725,633.

La Grange, Donald E.: *See—*
Beatty, Bobby D.; Butts, Gary D.; Herold, Stanley J.; and La Grange, Donald E., 3,724,385.

Laboratoires Jacques Logeais: *See—*
Molimard, Robert, 3,724,974.

Lacy, Mount, Enterprises, Inc., mesne: *See—*
Lacy, Mount L., 3,724,929.

Lacy, Mount L., to Lacy, Mount, Enterprises, Inc., mesne. Air free liquid variable light filter system. 3,724,929, Cl. 350-312.000.

Ladney, Michael, Jr. Plastic molding composition and method of preparation. 3,725,216, Cl. 204-30.000.

Ladouceur, Harold A.; and Steward, John H. Nut and panel assembly. 3,724,520, Cl. 151-41.730.

LaFranca, Peter J.: *See—*
Baraconi, William V.; and LaFranca, Peter J., 3,724,716.

Lagaholm AB: *See—*
Arvidsson, Carl-Eric, 3,724,697.

Lagally, Paul; and Nagy, Robert P., to United States of America, Navy. Low friction seawater lubricated bearing journal arrangement. 3,724,919, Cl. 308-238.000.

LaGrow, Alfred Cyrus. Toy hoop with stable platform for decorative display. 3,724,126, Cl. 46-220.000.

Laing, Charles F.: *See—*
Davidson, Cliff I.; and Laing, Charles F., 3,725,914.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Smith, Leon; Calvert, David W.; Robert, Andre; Viallet, Andre; and Pauw, Daniel R., 3,725,194.

Lake, Connie, to Mobil Oil Corporation. Door mounted, door operated holder for collapsible limp bags. 3,724,921, Cl. 312-237.000.

Lakomsky, Viktor Iosifovich: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,725,559.

Lamb, Reginald T., to Bausch & Lomb Incorporated, mesne. Electrostatic printing apparatus. 3,725,950, Cl. 346-74.0es.

Lambert, Robert R., to Air Factors, Inc. Fire resistant air bar for use in a suspended ceiling structure. 3,724,356, Cl. 98-40.00d.

Lambie, Alan James: *See—*
Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert, 3,725,554.

Lancor, Ellen B.: *See—*
Lancor, Joseph H., Jr.; and Cooper, Dexter P., Jr., 3,724,343.

Lancor, Joseph H., Jr.; deceased (by Lancor, Ellen B.; administratrix); and Cooper, Dexter P., Jr., to Bell & Howell Company. Analytical photographic exposure meter. 3,724,343, Cl. 95-10.00r.

Landgraf, William B.: *See—*
Anderson, Robert M.; Hanson, James M.; Lecrone, Richard C.; and Landgraf, William B., 3,725,693.

Lane, Bert: *See—*
Elson, Edward E.; McQuary, Kenneth L.; Karlin, George H.; and Lane, Bert, 3,724,516.

Lane, Kenneth H., to Kearney & Trecker Corporation. Method of forming T-slots in a machine tool table. 3,725,634, Cl. 219-121.0em.

Laney, Barton H., to Nuclear-Chicago Corporation. Method and apparatus for determining efficency in a liquid scintillation counting system. 3,725,657, Cl. 250-71.50r.

Lang, Ernest U., to National-Standard Company. Reducing and sintering furnace means. 3,724,977, Cl. 425-72.000.

Lang, Willi; and Sprenger, Manfred, to Audi Nsu Union Aktiengesellschaft. Airing device for motor vehicles. 3,724,358, Cl. 98-2.180.

Langan, Marion J., to Avco Corporation. Capacitance compensation circuit for differential amplifier. 3,725,804, Cl. 330-69.000.

Langdon, Michael J.: *See—*
Draugelis, Vaidevutis C.; Hartman, William R., Jr.; Langdon, Michael J.; and McCarroll, Alan F., 3,724,943.

Langguth, Arthur F.: *See—*
Johnson, Clarence S.; and Langguth, Arthur F., 3,725,173.

Langner, Ralph Rolland: *See—*
Moore, William Ross; and Langner, Ralph Rolland, 3,725,125.

Lanier, Harold H.: *See—*
Cook, Harold E.; and Lanier, Harold H., 3,725,911.

Lanmon, C. P., II, to Schlumberger Technology Corporation. Methods for recompleting wells. 3,724,550, Cl. 166-285.000.

Lanoux, Sigred B.; Ellzey, Samuel E., Jr.; Drake, George L., Jr.; and Reeves, Wilson A., to United States of America, Agriculture. Phosphinidynetrimethanol triacetate and its application to cellulosic materials. 3,725,001, Cl. 8-189.000.

Lansing Bagnall Limited: *See—*
Goodacre, Cecil, 3,724,586.

Lansing Research Corporation: *See—*
Johnston, Thomas F., Jr., 3,724,953.

Laparre, Jacques: *See—*
Allard, Pierre; Laparre, Jacques; and Lemaitre, Claude, 3,724,219.

Lapeyre, James M. Conveyor drive. 3,724,285, Cl. 74-243.0fc.

Lapidus, Milton; and McGettigan, Marian M., to American Home Products Corporation. L-4'-cyano-3-(2,2,2-trifluoroacetamido) succinanilic acids. 3,725,453, Cl. 260-465.00d.

Larde, Raymond: *See—*
Queuille, Andre; and Larde, Raymond, 3,725,541.

Larionav, Igor Naumovich: *See—*
Roizin, Natan Moiseevich; Larionav, Igor Naumovich; and Kolesova, Alvina Grigorievna, 3,725,147.

Larsen, Richard J.: *See—*
Rodgers, John T.; Williams, Richard M.; and Larsen, Richard J., 3,725,110.

Larson, Sherman L.: *See—*
Beer, Carl C.; and Larson, Sherman L., 3,724,390.

Lassmann, Heribert; and Woog, Rudolf, to Maschinenfabrik Briem-Hengler & Cronemeyer K.G. Apparatus for cutting out forms from a ribbon of dough. 3,724,980, Cl. 425-102.000.

Latash, Jury Vadimovich; Medova, Boris Izrailevich; and Baglai, Vitaly Mikhailovich. Apparatus for electroslag remelting of metals. 3,724,530, Cl. 164-252.000.

Latone, Salvatore; and Stanley, Michael R., to Xerox Corporation. Magnetic brush developing apparatus. 3,724,422, Cl. 118-637.000.

Laue, Terry J.; and Buck, Leo V., to Fedders Corporation. Delicate goods tray. 3,724,095, Cl. 34-139.000.

Lauge, Raitis; and Hart, Edward Raymond, to Union Carbide Canada Limited. Rotatable extrusion apparatus. 3,724,978, Cl. 425-86.000.

Launer, Leland C.: *See—*
Putnam, Allen Lewis, 3,724,119.

Lauria, Richard J.: *See—*
Wagensommer, Joseph; Lauria, Richard J.; and Staib, John H., 3,725,364.

Lautenschlaeger, Karl, Jun., to Lautenschlaeger, Karl, KG. Snap hinge for furniture doors. 3,724,021, Cl. 16-163.000.

Lautenschlaeger, Karl, KG: *See—*
Lautenschlaeger, Karl, Jun., 3,724,021.

LaValle, Thomas Alvin, to Western Electric Company, Incorporated. Methods of testing the strength of wire bonds in electrical components. 3,724,264, Cl. 73-88.00b.

LaValle, Thomas Alvin, to Western Electric Company, Incorporated. Apparatus for testing the strength of the joint of a wire joined to a part. 3,724,265, Cl. 73-88.00b.

Lawjack Equipment Limited: *See—*
Jackson, Lawrence D. A., 3,724,807.

Lawler, Gerald J. Portable sample case. 3,724,617, Cl. 190-16.000.

Lawlor, Reed C. Computer utilizing random pulse trains. 3,725,677, Cl. 307-260.000.

Lawson, Maurice O.; and Willke, Theodore L., to United States of America, Air Force. Corona discharge electrode structure for electrofluid dynamic generator. 3,725,737, Cl. 317-3.000.

Le Blanc, Walter J.; and Rohrlack, Friedrich K. W., to Goodrich, B. F., Company, The. Segmented friction member for brake or clutch. 3,724,624, Cl. 192-107.00r.

Le Boeuf, Joe S., to Continental Carbon Company. Spring hanger. 3,724,178, Cl. 55-341.000.

Le Cheualier, Pierre; and Blangis, Jacques. Apparatus for positioning and securing a projectile holder on its pad. 3,724,321, Cl. 89-1.800.

Le Douarec, Jean-Claude: *See—*
Beregi, Laszlo; Hugon, Pierre; and Le Douarec, Jean-Claude, 3,725,432.

Lea-Ronal, Inc.: *See—*
Kessler, Richard B.; and Nobel, Fred I., 3,725,220.

Leary, David E.: *See—*
Marzocchi, Alfred; and Leary, David E., 3,725,123.

LeBlond, Inc.: *See—*
Goebel, Fred M., 3,724,291.

Lebourg, Pierre, to Thomson-CSF. System for magnetic recording and reproducing of a signal by means of a frequency-modulated retangular wave. 3,725,609, Cl. 179-100.20k.

Lecrone, Richard C.: *See—*
Anderson, Robert M.; Hanson, James M.; Lecrone, Richard C.; and Landgraf, William B., 3,725,693.

Lectus AB: *See—*
Helmerson, Per-Erik, 3,724,156.

Lednicer, Oliver: *See—*
D'Amato, Salvatore F.; Guertin, Clifford D.; and Lednicer, Oliver, 3,725,694.

Lee, Max N. Y.: *See—*
Turnock, Philip H.; Bancroft, William G.; and Lee, Max N. Y., 3,725,299.

Lee, Tien Pei, to Bell Telephone Laboratories, Incorporated. Optical pulse modulator. 3,724,926, Cl. 350-160.00r.

Leeper, Charles G. Truss transporting body. 3,724,696, Cl. 214-512.000.

Lefebvre, Gerard, to Produits Chemiques Pechiney-Saint-Gobain, mesne. Binders for mortars. 3,725,335, Cl. 260-40.00r.

Lefebvre, Michel S. M.; and Hennion, Jean-Claude M. L., to Omnium de Prospective Industrielle. Process for the continuous treatment of threads using shock waves. 3,724,088, Cl. 34-16.000.

Legal, Casimer C., Jr., to Grace, W. R., & Co. Purification of waste water. 3,725,265, Cl. 210-45.000.

Lehari, Eckmar; and Schwarztrauber, Manfred, to Siemens Aktiengesellschaft. Method of and apparatus for representing measured values on the screen of a video apparatus. 3,725,901, Cl. 340-324.00a.
Leimbach, Wendell B.; Marshall, James W.; and Abbratozzato, Salvatore R., to Black and Decker Manufacturing Company. Field sub-assembly for universal electric motors. 3,725,707, Cl. 310-71.000.
Leinfelt, Karl Eric, to Aktiebolaget Electrolux. Self-sealing end closure for disposable dust bag. 3,724,179, Cl. 55-367.000.
Leistner, Rudolf; Roth, Johann; and Renndorfer, Alfred, to Niezoldi & Kramer GmbH. Motion picture camera. 3,724,936, Cl. 352-91.000.
Leisure-Tron Corporation: *See*—
Brooks, Howard A.; and Burzan, Vernon J., 3,724,854.
Leliovsky, Anton Felixovich; Ryabinin, Vladimir Alexandrovich; Terra, Karl Romanovich; and Yankevich, Kira Boleslavovna. Grid-controlled microwave thermionic device. 3,725,717, Cl. 313-302.000.
Lemaitre, Claude: *See*—
Allard, Pierre; Laparre, Jacques; and Lemaitre, Claude, 3,724,219.
Lemberger, Robert A.; and Gilmore, Jerry L., to Missouri Engineering Corporation. Sewage treatment system. 3,724,664, Cl. 210-104.000.
Lemelson, Jerome H. Flying model airplane. 3,724,123, Cl. 46-78.000.
Lemon, Robert W.: *See*—
Clauss, Julius A., Jr.; Conley, Jack S.; and Lemon, Robert W., 3,724,626.
Lenfant, Rene; and Petitjean, Guy, to Compagnie Generale d'Electricite. Multiple focusing device. 3,724,924, Cl. 350-167.000.
Leng, John Lindley: *See*—
Austin, Peter William; Crabtree, Allen; Leng, John Lindley; Robert, Denis; Ridyard, Annesley; and Young, Elliott, 3,725,383.
Leonard, Richard Lloyd; and Bashaw, John Darrell. Asymmetric hollow fiber membranes and method of fabrication. 3,724,672, Cl. 210-500.000.
Leonard, Stephen C.; and Dilick, Maurice D., to General Electric Company. Testing apparatus having improved means for maintaining a constant density of magnetic flux induced in a moving strip of metal. 3,725,778, Cl. 324-34.00r.
Lesage, Jean; and Dawans, Francois, to Institut Francois du Petrole, des Carburants et Lubrifiants. Compositions containing amorphous 1,2-polybutadiene and cis-1,4-polybutadiene. 3,725,331, Cl. 260-33.6aq.
Lesiecki, Gerald, to Allis-Chalmers Manufacturing Company. Trapped bushing seal. 3,724,861, Cl. 277-25.000.
Lessona Corporation: *See*—
Cardoz, John V., 3,724,192.
Levenson, Nathan S. Housing assembly on a hillside. 3,724,147, Cl. 52-169.000.
Lever Brothers Company: *See*—
Pettigrew, Robert, 3,725,286.
Leverenz, John H., to Gehl Company. Blade sharpening device for rotatable chopping cylinders. 3,724,139, Cl. 51-249.000.
Levesque, Peter S., to Fischer & Porter Co. Hybrid process controller operable in the automatic and manual mode. 3,725,762, Cl. 318-591.000.
Levin, Martin E., to Varian Associates. Apparatus for loading cavity resonators of tunable velocity modulation tubes. 3,725,721, Cl. 315-5.430.
Levoin, Jacques, to Plastica Sudamericana. Writing device having a retractable writing element. 3,724,961, Cl. 401-110.000.
Levy, Jose, to Compagnie des Freins et Signaux Westinghouse. Electrodynamic self-lapping valve. 3,724,913, Cl. 303-20.000.
Levy, Newton, Jr.; Wirth, David Griffith, Jr.; and Rettew, Richard Raymond, to Grace, W. R., & Co. Doped alumina powder. 3,725,094, Cl. 106-62.000.
Lewandowski, Stephen H., to Hamilton Alloy Products, Inc. Annular cutter for tubing. 3,724,073, Cl. 30-347.000.
Lewis, Ernest E., to Gainesville Machine Company, Inc. Apparatus for killing poultry or other fowl. 3,724,029, Cl. 17-11.000.
Lewis, George R.: *See*—
Crawford, Jack A.; Lewis, George R.; and Woodworth, William H., 3,725,576.
Lexsuco, Inc.: *See*—
Curtis, Frank W., 3,725,185.
Li, Hsin Lang; Prevorsek, Dusan Ciril; and Rothmayer, Noel York, to Allied Chemical Corporation. Yarn texturizing apparatus and process. 3,724,039, Cl. 28-1.500.
Libbey-Owens-Ford Company: *See*—
Roetter, Robert P.; Miller, Alfred H.; and Quinn, John D., 3,725,026.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Gnoth, Bernhard, 3,724,835.
Rapparlie, Hans, 3,724,640.
Reuter, Ernst Gottfried, 3,725,672.
Lichte, Henry P., Jr., to Sperry Sun Well Surveying Company. Instrument mounting. 3,724,086, Cl. 33-304.000.
Liebergott, Norman: *See*—
de Montigny, Raimbault M.A.T.; Liebergott, Norman; and Pounds, Derrick P.W., 3,725,193.
Liebrandt, Karl: *See*—
Zeingenberger, Arno; and Hagel, Adolf, 3,724,241.
Liechti, Peter: *See*—
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, 3,725,395.
Life Support, Inc.: *See*—
Thompson, Tommy Lewis, 3,725,156.
Lilly, Eli, and Company: *See*—
Cannon, William N., 3,725,479.
Lima, Jorge Rodrigues. Solid ovoscope. 3,724,448, Cl. 128-6.000.
Lindbergh, Karl E. E.: *See*—
Andersson, Johan B.; and Lindbergh, Karl E. E., 3,725,130.
Linde, John P.: *See*—
Bullis, Douglas E.; and Linde, John P., 3,724,112.
Lindell, Grover F.: *See*—
Matsuyama, George; and Lindell, Grover F., 3,725,237.
Lindner, Allen J.: *See*—
Lindner, Ronald J.; Lindner, Allen J.; and Adams, Nicholas S., 3,724,116.
Lindner, Ernst: *See*—
Stache, Ulrich; Fritsch, Werner; Haede, Werner; Radscheit, Kurt; and Lindner, Ernst, 3,725,393.
Lindner, Ronald J.; Lindner, Allen J.; and Adams, Nicholas S. Fish hook for use with a plastic worm. 3,724,116, Cl. 43-42.240.
Link, Martin, to Johnson & Johnson. Peelable surgical package. 3,724,651, Cl. 206-56.0aa.
Link, William T., to Andros Incorporated. Fluorescent source non-dispersive infrared gas analyzer. 3,725,701, Cl. 250-43.500.
Linn, Bruce O.: *See*—
Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzell, Bruce E., 3,725,548.
Linn, Richard L., to Underwriters Safety Device Company. Connector for high amperage applications. 3,725,851, Cl. 339-198.00n.
Linville, Roy Norman: *See*—
Cabell, Robert G.; Yancey, Thomas A.; Linville, Roy Norman; and Harrington, Daniel J., 3,724,439.
Lion Fat & Oil Co., Ltd.: *See*—
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Hirakawa, Michio, 3,725,336.
Lipsky, Philip: *See*—
Fleischer, Herman J.; Lipsky, Philip; and Tiblin, Bert V., 3,725,918.
Lipsky, Seymour R.: *See*—
Horvath, Csaba; and Lipsky, Seymour R., 3,725,111.
Liston, Edward R.: *See*—
Wainwright, Ralph E.; and Liston, Edward R., 3,724,641.
Lithium Corporation: *See*—
Morrison, Robert C.; and Kamienski, Conrad W., 3,725,368.
Littel, Randel Q.: *See*—
Traise, Thornton P.; Watson, Roger W.; and Littel, Randel Q., 3,725,480.
Littlefuse, Inc.: *See*—
Kruse, Marvin A., 3,725,626.
Littlehales, Herbert James, to Lucas, Joseph, (Industries) Limited. Fuel injection systems. 3,724,823, Cl. 261-69.00r.
Locante, John: *See*—
Harstead, Gunnar A.; Locante, John; and Russell, James G., 3,725,198.
Lochridge, Joe C.: *See*—
Jones, Jerry J.; and Lochridge, Joe C., 3,725,919.
Lockheed Aircraft Corporation: *See*—
Buchanan, Robert A.; Tecotzky, Melvin; and Wickersheim, Kenneth A., 3,725,704.
Finkel, Abraham M.; and Surwill, Michael, 3,724,053.
Selle, Wolfgang H., 3,724,323.
Stang, Paul F., 3,725,941.
Lockwood, Lynn L., to Antennacraft Company. Geared folding antenna. 3,725,945, Cl. 343-882.000.
Logan, William A.: *See*—
Balogh, Edward, Jr.; Bennett, James Russell; Keenan, William F.; Logan, William A.; and Murphy, John S., 3,725,872.
Logman, Hendrik: *See*—
Hofstede, Marinus Johannes; and Logman, Hendrik, 3,724,258.
Loison, Robert. Heads for hydrocyclonic separators. 3,724,674, Cl. 210-512.000.
Loitiere, Alain: *See*—
Bourgoin, Gerard; Kumurdjian, Pierre; Loitiere, Alain; and Pere, Jean-Francois, 3,725,685.
Lok, Harmannus Henderikus, to Nereid N.V. Coupling submersible to service craft. 3,724,410, Cl. 114-16.00r.
Long, Marvin B.; and Crown, William A. Rotary lawnmower attachment. 3,724,182, Cl. 56-10.400.
Longstaff-Tyrrell, John, to Lucas, Joseph, (Industries) Limited. Fuel injection systems. 3,724,434, Cl. 123-117.00r.
Loomis, Donald C., to Sola Basic Industries, Inc. Telephone station connection system. 3,725,588, Cl. 179-5.00r.
Loop, Frederick M., to PPG Industries, Inc. Partial insulation of an electrodeposition tank. 3,725,234, Cl. 204-181.000.
Lorain Products Corporation: *See*—
Brown, Harold J., 3,725,766.
Mesenhimer, Lee O., 3,725,795.
Lord Corporation: *See*—
Owston, William J., 3,725,504.
Lorenzini, Raymond; and Kinsella, Richard I., to Eastman Kodak Company. Misaligned end cap detecting mechanism for a capping device. 3,724,162, Cl. 53-78.000.
Lorinder, Hans Goran: *See*—
Ridder, Georg Sven-Olof; and Lorinder, Hans Goran, 3,724,892.

Love, Fred W.; and Hunt, William J., to Aeroquip Corporation. Method of making wire braid hydraulic hose. 3,725,167, Cl. 156-143.000.
Lovelock, James Ephraim. Detection of trace gases utilizing an electron capture detector. 3,725,009, Cl. 23-232.00c.
Loyk, Victor, to United States of America, Navy. Automatic feedback closed loop system for forward speed control and braking control. 3,725,758, Cl. 318-269.000.
Lubrizol Corporation, The: *See—*
Jahnke, Richard William, 3,725,231.
Murphy, John P., 3,725,441.
Lucas, Joseph, (Industries) Limited: *See—*
Blakeley, Ronald Edward; and Turner, Robert, 3,724,259.
Littlehales, Herbert James, 3,724,823.
Longstaff-Tyrrell, John, 3,724,434.
Lucasey, Joseph A. Stand for supporting an appliance. 3,724,798, Cl. 248-418.000.
Luders, Walter; Steppan, Hartmut; and Klupfel, Kurt-Walter, to Kalle Aktiengesellschaft. Polymeric N-carbonyl sulfonamides in photopolymerizable compositions and process for preparation. 3,725,356, Cl. 260-77.5ch.
Ludlow, David L. Collision warning indicator. 3,725,934, Cl. 343-112.0ca.
Ludueni, Froilan P., to Sterling Drug Inc. Method of producing nasal vasoconstriction. 3,725,552, Cl. 424-330.000.
Ludwig Taprogge: *See—*
Thal, Heinz, 3,724,669.
Ludwig, Walter, to Schweizerische Industrie-Gesellschaft. Safety device for the firing pin of hand firearms or small arms. 3,724,113, Cl. 42-70.00f.
Lugo, Luigi: *See—*
Barilli, Filippo; Lugo, Luigi; Di Fiore, Lucio; and Reni, Cesare, 3,725,255.
Lugo, Luigi; Calcagno, Benedetto; and Reni, Cesare, to Societe Italiana Resine S.p.A. Process for separating aromatic hydrocarbons from mixtures thereof with paraffins and naphthene hydrocarbons. 3,725,256, Cl. 208-331.000.
Lukens, Alan Franck, to General Electric Company. Heat transfer system for dynamoelectric machine. 3,725,706, Cl. 310-62.000.
Lukianov, Roman E.: *See—*
Kefalas, John H.; and Lukianov, Roman E., 3,725,882.
Lum, Kin Kwong: *See—*
Anderson, Albert E.; and Lum, Kin Kwong, 3,725,062.
Lundeen, Howard R.: *See—*
Sollami, Blase J.; Lundeen, Howard R.; and Gerth, Bruce F., 3,724,228.
Lundquist Tool and Manufacturing Co., The: *See—*
Roider, Richard Harden, 3,724,884.
Lutter, Edward P.: *See—*
Edstrom, Gene H.; and Lutter, Edward P., 3,725,655.
Lyass, Abram Moiseevich; Snulova, Lidia Dorofeevna; Borsuk, Pavel Afanasievich; Tsyruleva, Anna Ivanovna; and Teplyakov, Sergei Dmitrievich. Method of preparing a liquid mixture for the production of foundry cores and moulds. 3,725,090, Cl. 106-38.350.
Lynch, John F., to National Beryllia Corporation. Composite ceramic articles. 3,725,186, Cl. 161-109.000.
Mac Donald, Donald J.: *See—*
Morrissey, James P.; and Mac Donald, Donald J., 3,724,271.
Mac Innis, Martin B.: *See—*
Martin, Brice E.; and Mac Innis, Martin B., 3,725,524.
MacDuff, Stanley Irving, to Bendix Corporation, The. Hydraulic pressure modulator. 3,724,915, Cl. 303-21.00f.
Machin, James Robert: *See—*
Colston, John Matthew; and Machin, James Robert, 3,725,723.
Mack, Michael E.; and Mongeon, Robert J., to United States of America, Navy, mesne. Ultrafast multiple flashlamp. 3,725,733, Cl. 315-228.000.
Mack, Richard B.: *See—*
Sletten, Carlyle J.; Schell, Allan C.; Mack, Richard B.; Goggins, William B., Jr.; and Blacksmith, Philipp, 3,725,917.
MacKelvie, Philip A., to Multi-Point Tool Co., Inc. Tool holder assembly. 3,724,301, Cl. 82-36.000.
Mackey, E. Scudder, to GAF Corporation. Coating formulations containing phosphate ester of glycidol polyethers. 3,725,079, Cl. 96-114.500.
Mackey, E. Scudder, to GAF Corporation. Coating formulations containing the reaction product of glycidol polyethers and sulfating agents. 3,725,080, Cl. 96-114.500.
MacLean, Alexander F.; Hobbs, Charles C., Jr.; and Dougherty, Edward F., to Celanese Corporation of America. Preparation of dihaloalkanes and related products. 3,725,487, Cl. 260-659.00r.
MacManus, John. Machines for producing and depositing aerated emulsion products. 3,724,417, Cl. 118-24.000.
Macura, Joseph Steven: *See—*
Murthy, Nanjundiah Narasimha; Macura, Joseph Steven; Gergely, William, Jr.; and Berg, Allen Charles, 3,724,366.
Madgefrau, Herbert: *See—*
Schneider, Karl-Heinz; Herker, Dietrich; Madgefrau, Herbert; Plockl, Alfons; and Horrwarth, Ernst, 3,725,620.
Maeder, Erwin: *See—*
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, 3,725,395.
Maes, Roland. Enhancement of antibody production by nucleic acid-polycation complexes. 3,725,545, Cl. 424-180.000.
Maezawa, Shiro; Yoshikawa, Hiroshi; Sakamoto, Kenji; Fujii, Jun; and Hashimoto, Makoto, to Nippon Kayaku Company, Ltd. Process for purification of acrylic acid from aldehydes by distillation with a reagent. 3,725,208, Cl. 203-8.000.
Mageli, Orville Leonard: *See—*
D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, 3,725,455.
Mager, Donald V., to Sperry Rand Corporation. Temperature controlled clocking of logic circuits. 3,725,789, Cl. 328-3.000.
Magidson, Herbert. Insole structure. 3,724,106, Cl. 36-44.000.
Maginot, Pierre: *See—*
Friberg, Jean-Marie; Maginot, Pierre; and Merigoux, Jean-Marie, 3,724,968.
Maher, James Bernard; and Sudduth, Jackie Wayne, to Chicago Bridge & Iron Company. Method and apparatus for liquefying gases. 3,724,227, Cl. 62-40.000.
Maiear, William H., to Universal Oil Products Company. Desulfurization with subsequent H_2S absorption. 3,725,252, Cl. 208-213.000.
Main, Ralph R.: *See—*
Rohrlack, Friedrich K. W.; and Main, Ralph R., 3,724,625.
Makachev, Nikolai Ivanovich; and Parshin, Alexei Nikolaevich. Warp thread tension device in a loom. 3,724,514, Cl. 139-100.000.
Makarewicz, Antoni: *See—*
Balbatun, Jan; and Makarewicz, Antoni, 3,724,190.
Maki, Michiyoshi, to Hitachi, Ltd. Method for manufacturing semiconductor devices. 3,725,145, Cl. 148-175.000.
Makinen, Winnifred B.; and Srail, Raymond C., to Goodrich, B. F., Company, The. Elastic overshoes. 3,724,107, Cl. 36-7.300.
Makow, Abraham, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Spin-stabilised rocket projectile. 3,724,781, Cl. 244-3.230.
Mal, M. Kumar; and Tarkan, Stuart E., to Chromalloy American Corporation. Titanium carbide hard facing steel-base composition. 3,725,016, Cl. 29-182.300.
Malabanan, Alejandro L.; and Acepcion, Antonio T. Automatic motorized baby crib. 3,724,006, Cl. 5-109.000.
Malkiewicz, Wladyslaw F., to Tenneco Inc. Folded shell muffler. 3,724,591, Cl. 181-53.000.
Mallory, George R., to Mallory Hardware Products Limited. Combined squeegee and scouring pad window cleaning implement. 3,724,017, Cl. 15-121.000.
Mallory Hardware Products Limited: *See—*
Mallory, George R., 3,724,017.
Malmer, Michael M., Jr.; Perkins, Cornelius C.; Waldenmayer, Donald W.; Chowning, Patrick J.; and Gardner, Leonard R., to Burroughs Corporation. Small reconfigurable processor for a variety of data processing applications. 3,725,868, Cl. 340-172.500.
Malta, Jacob H.; and Cassel, Harrison E., to Schulmerich Manufacturing Co. Money clip alarm for a cash drawer. 3,725,893, Cl. 340-280.000.
Maltenfort, Martin S. Wick support and storage means for non-spillable safety wick dispenser bottles. 3,724,756, Cl. 239-47.000.
Mamaev, Igor Ivanovich: *See—*
Sokolsky, Valery Nikolaevich; and Mamaev, Igor Ivanovich, 3,725,738.
Mancini, Paul A.; and May, Walter G., to Esso Research and Engineering Company. Separation of carbon dioxide from a natural gas stream. 3,724,225, Cl. 62-12.000.
Mandeville, Arthur R., to Scott Paper Company. Apparatus for drying an electrophotographic support element. 3,724,096, Cl. 34-150.000.
Mann, George, to United Aircraft Corporation. Display centering system. 3,725,722, Cl. 315-21.00r.
Mansei Kogyo Kabushiki Kaisha: *See—*
Goto, Kenijiro, 3,724,993.
Mansell, Dennis N., to United States of America, Air Force. Fan geometry mixing laser. 3,725,816, Cl. 331-94.500.
Manson, Edwin E., to MI2, Inc. Input-output typewriter apparatus. 3,724,630, Cl. 197-19.000.
Manufacture d'Accumulateurs et d'Objets Moules: *See—*
Brocart, Rene; and Bourez, Henri, 3,724,051.
Marathon Oil Company: *See—*
Knight, Bruce L., 3,724,545.
Marcinkus, Donald W.: *See—*
Fanella, Robert J.; Marcinkus, Donald W.; and Sterly, Glenn E., 3,724,779.
Margosian, Zaven: *See—*
Weidman, Joseph S.; Yee, Henry C.; Elliott, Jack G.; and Margosian, Zaven, 3,725,921.
Maring, Donald G., Sr.: *See—*
Allen, Richard W.; Maring, Donald G., Sr.; and Andrews, Henry J., Jr., 3,725,613.
Maringer, Robert; and Cordelle, Claude, to Villeroy & Boch S.A. Installation for manufacturing ceramic bathroom pieces. 3,724,979, Cl. 425-88.000.
Marino, Albert J. Dice tumbler. 3,724,857, Cl. 273-145.00b.
Marion, Jacques: *See—*
Borrel, Marcel; Marion, Jacques; and Metzger, Jean, 3,725,457.
Marks, Ronald A., to Consulting Specialists, Inc. Fluid-powered alarm system. 3,725,886, Cl. 340-224.000.
Marondel, Gunther: *See—*
Gawlick, Heinz; Marondel, Gunther; Sieglein, Werner; Wasser, Wolfgang; and Bendler, Hellmut, 3,724,381.
Marquip, Inc.: *See—*
Marschke, Carl R.; and Thomas, Richard H., 3,724,687.
Marr, Peter A.: *See—*
Bailey, Joseph; Knott, Edward B.; and Marr, Peter A., 3,725,067.

Marrocco, Dominic A.: *See—*
Gomez, Eloy A.; Goodsir, Stephen W.; and Marrocco, Dominic A., 3,724,460.

Marschke, Carl R.; and Thomas, Richard H., to Marquip, Inc. Panel board feeding apparatus. 3,724,687, Cl. 214-8.50d.

Marsh, Richard F.: *See—*
Allen, Ralph W.; and Marsh, Richard F., 3,725,169.

Marsh, Walter H. W.; and Coulombe, Lionel J., to Singer Company, The. Fancy stitch zigzag sewing machines. 3,724,404, Cl. 112-158.00b.

Marsh, William D.: *See—*
Coddington, David M.; Marsh, William D.; and Cohen, Harvey, 3,724,521.

Marshall, Hamilton W., Jr.; and Smeaton, John R., to Perkin-Elmer Corporation, The. Reaction detector. 3,725,204, Cl. 195-127.000.

Marshall, James W.: *See—*
Leimbach, Wendell B.; Marshall, James W.; and Abbratozzato, Salvatore R., 3,725,707.

Martin, Brice E.; and Mac Innis, Martin B., to GTE Sylvania Incorporated. Rhenium and molybdenum separation from sulfide ores. 3,725,524, Cl. 423-49.000.

Martin, David H., to International Business Machines Corporation. Functional memory cell. 3,725,879, Cl. 340-173.0am.

Martin, Helmut: *See—*
Staschewski, Alfred; Pflaum, Rudolf; and Martin, Helmut, 3,725,139.

Martin, Ralph E. Imprinting cylinder with removable imprinting block. 3,724,370, Cl. 101-377.000.

Martin Stamping & Stove Company: *See—*
Carson, Walter C., 3,724,443.

Martin, Wilhiam A.; and Saint Clair, John Q., II, to Eastman Kodak Company. Motion picture projector apparatus. 3,724,777, Cl. 242-195.000.

Martin, William A., to Eastman Kodak Company. Tape recorder apparatus. 3,724,858, Cl. 274-4.00e.

Martini, Joseph C., to Gulf Research & Development Company. Separation of meta and para-cresol. 3,725,485, Cl. 260-621.00a.

Marukin Shoyu Company, Limited: *See—*
Sugimori, Tsunetake; Tsukada, Yoji; and Tazuke, Yasuhiko, 3,725,201.

Maruzen Oil Company, Limited: *See—*
Sakai, Yoshinori; and Hori, Takashi, 3,725,381.

Marvan, Petr: *See—*
Serbus, Ctibor; Rezac, Jan; Pribil, Stanislav; Marvan, Petr; Krejdirik, Libor; and Stoy, Artur, 3,725,291.

Marvel, Carl S.; and Chow, Roberta C. L., to United States of America, Agriculture. Copolymers of vinyl monomers and polyesters. 3,725,442, Cl. 260-405.000.

Marvin, Edgar S.: *See—*
Jenkins, Gerald L.; Jungjohann, Vernon H.; Marvin, Edgar S.; and Seely, Neil G., 3,724,937.

Marx, John W.: *See—*
Parker, Harry W.; and Marx, John W., 3,724,548.

Marx, Louis, & Co., Inc., mesne: *See—*
Kuramochi, Shigeaki, 3,724,632.

Marzocchi, Alfred; and Leary, David E., to Owens-Corning Fiberglas Corporation. Glass fiber reinforced elastomers. 3,725,123, Cl. 117-126.0ge.

Masaaki, Taimoto; and Satoru, Honjo, to Fuji Photo Film Co., Ltd. Hematein or hematoxylin-containing zinc oxide photoconsuctive layers. 3,725,060, Cl. 96-1.700.

Masanaru, Hasegawa: *See—*
Hayashi, Yoshiki; and Masanaru, Hasegawa, 3,725,058.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Japes, Manfred, 3,724,015.

Maschinenfabrik Briem-Hengler & Cronemeyer K.G.: *See—*
Lassmann, Heribert; and Woog, Rudolf, 3,724,980.

Masco Corporation: *See—*
Mitich, Stephen R., 3,724,824.

Masco Corporation, mesne: *See—*
Fathauer, George H., 3,725,788.

Mase, Jiro: *See—*
Sugawara, Tsunenori; and Mase, Jiro, 3,724,689.

Masiello, Felix R., to Addressograph-Multigraph Corporation. Sheet feeding and cutting device. 3,724,945, Cl. 355-29.000.

Maskery, Arthur, to Westinghouse Brake and Signal Company, Limited. Magnetic amplifiers and apparatus. 3,724,392, Cl. 105-61.000.

Mason, Paul A. Outrigger mount for fishing boats. 3,724,791, Cl. 248-42.000.

Mason, Ralph B.: *See—*
Hamner, Glen P.; and Mason, Ralph B., 3,725,242.

Mason, Richard K., to Textron, Inc. Self monitoring control system utilizing an electrical model for each control means. 3,724,330, Cl. 91-363.00a.

Masoneilan International, Inc.: *See—*
Baumann, Hans D., 3,724,813.

Massillon Measurements, Inc.: *See—*
Gessner, Richard W.; and Davies, Roy E., 3,725,134.

Massonne, Joachim: *See—*
Paucksch, Heinrich; Massonne, Joachim; Bohm, Horst; and Fernschild, Gunter, 3,725,475.

Masten, Michael K.: *See—*
Choate, William C.; and Masten, Michael K., 3,725,875.

Masters, Leonard Kenneth Morgan; and Dalziel, Thomas, to Hobbs, Russell, Limited. Beverage maker. 3,724,359, Cl. 99-281.000.

Masuda, Senichi. Method and apparatus for forming a beam of charged particles. 3,725,797, Cl. 328-228.000.

Masuda, Takao: *See—*
Inoue, Takashi; Masuda, Takao; and Harada, Takeshi, 3,724,431.

Masuko, Tatuo: *See—*
Miyadera, Yasuo; Masuko, Tatuo; Muroi, Tadashi; Noguchi, Hiroshi; and Kawashima, Hideo, 3,725,344.

Masumoto, Hakaru; Sawaya, Shohachi; and Kikuchi, Michio, to Foundation Research Institute of Electric and Magnetic Alloys, The. Nonmagnetic resilient manganese-copper alloy having a substantially temperature-free elastic modulus. 3,725,052, Cl. 75-134.00m

Masumoto, Hakaru; Sawaya, Shohachi; and Michio, Kikuchi, to Foundation Research Institute of Electric and Magnetic Alloys, The. Nonmagnetic resilient manganese-nickel alloy having a small temperature coefficient of elastic modulus and method for manufactuing the same. 3,725,053, Cl. 75-134.00m.

Masumura, Isao: *See—*
Fujimoto, Yasuo; Masumura, Isao; Tatsukawa, Keizo; Koshimoto, Shinsuke; and Doiuchi, Toru, 3,725,353.

Mateju, Vladimir: *See—*
Jekl, Frantiek; Mateju, Vladimir; Pech, Josef; and Hrdina, Karel, 3,724,508.

Mather, John: *See—*
Harrison, Albert Keith; and Mather, John, 3,725,348.
Harrison, Albert Keith; and Mather, John, 3,725,351.

Mathews, Harold F.; Reeder, Jack M.; and Ingram, James A. Audio visual program rating system. 3,725,603, Cl. 179-100.10r.

Matkovich, Vlado I.: *See—*
Economy, James; and Matkovich, Vlado I., 3,725,533.

Matsui, Kazuma; and Tsubouchi, Hideo, to Nippondenso Kabushiki Kaisha. Apparatus for establishing a variation of time delay between input and output fluid signals. 3,724,504, Cl. 138-46.000.

Matsui, Masao: *See—*
Ando, Satoshi; Matsui, Masao; and Ogata, Fumimaro, 3,725,192.

Matsumoto, Seiji: *See—*
Honjo, Satoru; Matsumoto, Seiji; and Takimoto, Masaaki, 3,724,941.

Matsumoto, Toshiaki, to Minolta Camera Kabushiki Kaisha. Device for mounting electromagnetically attractable piece for latching electronic shutter in camera. 3,724,351, Cl. 95-53.00e.

Matsumoto, Toyosaku: *See—*
Yamada, Takashi; and Matsumoto, Toyosaku, 3,724,312.

Matsushita Denko Kabushiki Kaisha: *See—*
Kojima, Kiyoshi; and Abe, Toshiro, 3,725,820.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hayashi, Yoshiki; and Masanaru, Hasegawa, 3,725,058.
Tanaka, Yutaka, 3,725,592.
Wada, Mitsuo; Nishimoto, Kazuyuki; Aoki, Masaki; and Iida, Yoshio, 3,725,836.

Matsushita Electric Works, Ltd.: *See—*
Nakai, Kenichi; and Yamashita, Takehiko, 3,725,730.

Matsushita Electronics Corporation: *See—*
Hosokoshi, Kakuichiro, 3,725,106.

Matsuyama, George; and Lindell, Grover F., to Beckman Instruments, Inc. Apparatus for measuring ion activity of solutions. 3,725,237, Cl. 204-195.00l.

Mattel, Inc.: *See—*
Northrop, John H.; Jones, Eugene C.; Sioles, George W.; and Mellette, Gary W., 3,724,860.

Mattern, Konrad, to Metallgesellschaft Aktiengesellschaft. Tubular structure for film evaporators. 3,724,523, Cl. 159-13.00a.

Matthews, Jamie F., Jr., to Esso Production and Research Company. Method for installing double-walled pipelines. 3,724,224, Cl. 61-72.300.

Mattice, William G.; and Sanford, David A., to Waste Research and Reclamation Co., Inc. System and process for reclaiming forging compounds. 3,725,262, Cl. 210-42.000.

Mattson, Charles A., to Sunbeam Corporation. Lawn mower grass bag having a litter pocket. 3,724,186, Cl. 56-202.000.

Mattson, Richard A.: *See—*
Edwards, Norman W.; Derr, Vincent H.; and Mattson, Richard A., 3,724,704.

Mauer, Gerhard. Apparatus for testing the electrical conductivity of filaments. 3,725,779, Cl. 324-51.000.

Maxey, Edwin Morgan: *See—*
Fabris, Hubert Jakob; Maxey, Edwin Morgan; and Schmucker, Arden Everett, 3,725,357.

Maxon, Rodney Robert; and Meise, Henry August, Jr., to Bell Telephone Laboratories, Incorporated. PBX Automatic number identification system. 3,725,596, Cl. 179-18.0fh.

May, Robert C.: *See—*
Kordas, Martin W.; May, Robert C.; and Scanlon, John J., 3,724,376.

May, Walter G.: *See—*
Mancini, Paul A.; and May, Walter G., 3,724,225.

Mayer, Richard J.: *See—*
Kinberg, Benjamin; and Mayer, Richard J., 3,724,316.

Mayes, Nathan; Green, Joseph E.; and Michaels, Ronald, to Thiokol Chemical Corporation. Cured nitrosofluorocarbon rubber. 3,725,374, Cl. 260-92.100.

Mayo, Kenneth E.; and Fretague, William J., to Sanders Nuclear Corporation. Internally moderated heat sources and method of production. 3,725,663, Cl. 250-106.00s.

Mayr, Anton; Wagener, Kurt; Adolf, Johann Ditrich; Pette, Heinrich; deceased (by Pette, Christiane Wilhelmine; co-heiress); and Petzoldt, Klaus, to Behringwerke Aktiengesellschaft. Intramuscular vaccination program and vaccine against rhinopneumonitis and rocess for preparing it. 3,725,542, Cl. 424-89.000.

Maytag Company, The: *See—*
Davis, Gordon Jerry, 3,724,242.

Mayuzumi, Harutaka; Shinoda, Motoyuki; and Akizuki, Kosuke, to Isuzu Motors Limited. Shaving method and shaving cutter. 3,724,046, Cl. 29-104.000.

Mc Connell, Howard M.; and Zeewy, Abraham, to Harris-Intertype Corporation. Hoist static control. 3,725,756, Cl. 318-237.000.

Mc Cormick, Harold E.: *See—*
Prasse, Herbert F.; and Mc Cormick, Harold E., 3,725,017.

Mc Keown, James E.; Gregoire, Stephen E.; and Michel, Donald E., to Bendix Corporation, The. Hermaphroditic electrical contact. 3,725,844, Cl. 339-49.00r.

Mc Kinney, Ross E., to Air Products & Chemicals, Inc. Activated sludge process and system. 3,724,667, Cl. 210-195.000.

Mc Smith, Dwight G. Periodic table display device. 3,724,098, Cl. 35-18.00r.

McCarroll, Alan F.: *See—*
Draugelis, Vaidevutis C.; Hartman, William R., Jr.; Langdon, Michael J.; and McCarroll, Alan F., 3,724,943.

McCarroll, Raymond A. Wheel cover. 3,724,906, Cl. 301-37.00r.

McCarthy, Charles D.: *See—*
Foley, Charles F.; McCarthy, Charles D.; and Hardin, Charles H., 3,724,124.

McCaully, Ronald J.; Bell, Stanley C.; and Conklin, George L., to American Home Products Corporation. Adducts of delta-aminobenzylpenicillin and N-substituted-4-piperidones. 3,725,389, Cl. 260-239.100.

McCleerey, Earl W., to Westinghouse Electric Corporation. Portable hair dryer. 3,724,092, Cl. 34-99.000.

McClendon, Jack C.; and Berry, Elton L., to Dow Chemical Company, The. Aminoethylation of flour and starch with ethylenimine. 3,725,387, Cl. 260-233.30r.

McCord, Donald M., to Phillips Petroleum Company. Method of making reversible, non-woven material. 3,725,166, Cl. 156-148.000.

McCord, Henry L.: *See—*
Herman, Elvin E.; and McCord, Henry L., 3,725,915.

McCord, Wilfred M., Jr., to Vermont American Corporation. Collapsible saw. 3,724,519, Cl. 145-33.00e.

McCracken, William L.; Petering, Wilbur H.; Kircher, Charles E., Jr.; and Pinchak, Paul R., to Detrex Chemical Industries, Inc. Process for making 1,1-dichlorethylene from 1,1,2-trichlorethane. 3,725,486, Cl. 260-654.00d.

McCulloch, Charles R.; Moy, Bertram K.; and Randle, Thomas C., to United States of America, Navy. Mesa burning gas generator propellant. 3,725,154, Cl. 149-21.000.

McCurry, Robert E., to International Business Machines Corporation. Electro-ionic printing. 3,725,951, Cl. 346-74.0es.

McDermott, Michael S.; and Pederson, Carl A., to United States of America, Army, mesne. Electrical crowbar system with novel triggered spark gap devices. 3,725,729, Cl. 315-75.000.

McDonald, Allan J., to Thiokol Chemical Corporation. Rocket system. 3,724,217, Cl. 60-254.000.

McDonough Co.: *See—*
Eads, Harold O., 3,724,188.

McDonough, Thomas B., to Sylvania Electric Products Inc. Method of preparing fulminating material for photoflash lamp. 3,725,155, Cl. 149-31.000.

McDowell, Curtis S.: *See—*
Spector, Marshall L.; Jones, Robert D.; and McDowell, Curtis S., 3,725,258.

McElroy, Joseph A. Method of form tie removal. 3,724,060, Cl. 29-427.000.

McGettigan, Marian M.: *See—*
Lapidus, Milton; and McGettigan, Marian M., 3,725,453.

McGraw-Edison Company: *See—*
Kobler, Richard; Fagan, William F.; and Feldman, Edward, 3,724,859.
Rigert, Max, 3,725,830.
Stewart, Victor E., Jr., 3,725,774.

McInerney, F. Thomas, III: *See—*
Parker, John Henry; and McInerney, F. Thomas, III, 3,724,393.

McKee, Edward S., to Eastman Kodak Company. Film feeding apparatus. 3,724,776, Cl. 242-195.000.

McKeown, James E.; and Michel, Donald E., to Bendix Corporation, The. Electrical contact. 3,725,853, Cl. 339-252.00r.

McKibbin, Dean K., to Pittsburgh-Des Moines Steel Company. Expanding tube seal for floating roof structure. 3,724,705, Cl. 220-26.00r.

McKinley, Suzanne V.; and Rakshys, Joseph W., Jr., to Dow Chemical Company, The. Resins with phosphorane pendant groups and process for preparing same. 3,725,365, Cl. 260-80.710.

McKinnon, John P., to Westinghouse Electric Corporation. Electric disconnect switch having improved counter balance mechanism. 3,725,619, Cl. 200-48.00a.

McLain, John H. Solder coating apparatus. 3,724,418, Cl. 118-69.000.

McLean, Robert E., to Rival Manufacturing Company. Electric can opener with removable cutter mounting plate and pivotally attached hand lever. 3,724,069, Cl. 30-4.00r.

McMillan, Gilman C.: *See—*
Vogelhuber, Fred W.; Vogelhuber, Heather; and McMillan, Gilman C., 3,724,677.

McNaney, Joseph T. Electrically controllable light reflecting cell and means for utilization on a character presentation device. 3,725,910, Cl. 340-378.00r.

McNeece, Leonard D. Alignment apparatus. 3,724,084, Cl. 33-185.00r.

McNeil Laboratories, Inc.: *See—*
Poos, George Ireland, 3,725,435.

McPherson, Alexander W.: *See—*
Sendoykas, Jack J.; and McPherson, Alexander W., 3,724,836.

McPherson, Alexander W., to Dover Corporation De-Sta-Co Division. Retracting clamp. 3,724,837, Cl. 269-32.000.

McQuary, Kenneth L.: *See—*
Elson, Edward E.; McQuary, Kenneth L.; Karlin, George H.; and Lane, Bert, 3,724,516.

Mead Corporation, The: *See—*
Johnson, Roy A., 3,724,307.

Meador, William R.: *See—*
Durr, Albert M., Jr.; and Meador, William R., 3,725,280.

Mechanic-Esfihani, Bahram. Electronic conversion and secrecy apparatus. 3,725,595, Cl. 179-17.00b.

Meckley, George E., to Hanover Brands, Inc. Slicing machine. 3,724,306, Cl. 83-210.000.

Mederer, Gerhard. Rotary piston engine. 3,724,428, Cl. 123-8.470.

Media Services, Inc.: *See—*
Sellers, Walter M., Jr., 3,725,203.

Medical Electroscience and Pharmaceuticals, Inc.: *See—*
Gery, Herbert C.; and Samson, Marvin S., 3,724,369.

Medova, Boris Izrailevich: *See—*
Latash, Jury Vadimovich; Medova, Boris Izrailevich; and Baglai, Vitaly Mikhailovich, 3,724,530.

Mefina S.A.: *See—*
Fresard, Marcel; and Gabriel, Jean-Pierre, 3,724,406.

Mehl, Charles W. Magnetic strip drafting instrument. 3,724,083, Cl. 33-177.000.

Meier, Max, to Ciba-Geigy AG. Process for the photographic development of silver salts. 3,725,068, Cl. 96-66.0hd.

Meise, Henry August, Jr.: *See—*
Braun, Edwin Julius; Meise, Henry August, Jr.; and Taylor, George William, 3,725,598.
Maxon, Rodney Robert; and Meise, Henry August, Jr., 3,725,596.

Melchior, Gerard, to Compagnie Industrielle des Telecommunications CIT ALCATEL. Electronic amplifier circuit. 3,725,676, Cl. 307-255.000.

Mellette, Gary W.: *See—*
Northrop, John H.; Jones, Eugene C.; Sioles, George W.; and Mellette, Gary W., 3,724,860.

Meloni, Robert A.: *See—*
Wickham, John L.; Ramstrom, Lee W.; Wordsworth, Albert G.; and Meloni, Robert A., 3,724,563.

Membrino, Hercules. Bag making machine for thermoplastic bags. 3,725,180, Cl. 156-515.000.

Memodyne Corporation: *See—*
Wolf, Richard N., 3,724,780.

Menasco Manufacturing of Canada Ltd., mesne: *See—*
Ceska, Frank Z., 3,724,832.

Menissier, Pierre Lucien: *See—*
Chaulet, Roger Louis; Guichard, Claude Pierre Albert Louis; Menissier, Pierre Lucien; and Soret, Jean-Claude Georges, 3,724,529.

Mercier, Andre: *See—*
Retali, Roger; Mercier, Andre; and Billot, Claude, 3,724,238.

Merck & Co., Inc.: *See—*
Patchett, Arthur A.; and Windholz, Thomas B., 3,725,439.
Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzell, Bruce E., 3,725,548.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Rogalski, Werner; Jonas, Rochus; Wahlig, Helmut; and Bergmann, Rolf, 3,725,390.

Merigoux, Jean-Marie: *See—*
Friberg, Jean-Marie; Maginot, Pierre; and Merigoux, Jean-Marie, 3,724,968.

Merkel, Ronald F., to Texas Instruments, Incorporated. Infrared scanner system having increased resolution and method of using same. 3,725,662, Cl. 250-83.30h.

Merrels, Frederic Price. Multiple tool driving unit. 3,724,561, Cl. 173-50.000.

Merten, Rudolf: *See—*
Golitz, Hans Dietrich; Merten, Rudolf; Noll, Walter; and Simmler, Walter, 3,725,449.

Mesenhimer, Lee O., to Lorain Products Corporation. A-C voltage detector. 3,725,795, Cl. 328-135.000.

Messenger, Joseph U., to Mobil Oil Corporation. Technique for controlling lost circulation. 3,724,564, Cl. 175-72.000.

Messerschmidt, Harold J.; Heyman, Karl; and Johnsen, Bernadou W., II, to Mona Industries, Inc. Powderless etching bath compositions. 3,725,159, Cl. 156-14.000.

Messerschmidt, Harold J., Jr.; Heyman, Karl; and Johnsen, Bernadou W., II, to Mona Industries, Inc. Multi-component powderless etching bath additive. 3,725,158, Cl. 156-14.000.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Karch, Ludwig, 3,724,388.
Muller, Wolfgang; and Munding, German, 3,724,213.
Messinger, Werner, to Braun Aktiengesellschaft. Shearhead for dryshavers. 3,724,072, Cl. 30-346.510.
Metalem S.A.: *See—*
Feller, Gilbert, 3,724,202.
Metallgesellschaft Aktiengesellschaft: *See—*
Mattern, Konrad, 3,724,523.
Metysova, Jirina: *See—*
Protiva, Miroslav; Pelz, Karel; and Metysova, Jirina, 3,725,409.
Metzeler Aktiengesellschaft: *See—*
Federer, Fritz; and Neumann, Henning, 3,724,497.
Metzger, Jean: *See—*
Borrel, Marcel; Marion, Jacques; and Metzger, Jean, 3,725,457.
Metzinger, Adrien Louis; and Raillard, Charles, to American Tobacco Company Limited, mesne. Machine for inserting filters into tip-holders for smokers articles. 3,724,339, Cl. 93-1.00c.
Meyer, Hans Rudolf: *See—*
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, 3,725,395.
Meyer, Jeffrey G.: *See—*
Huerta, James R.; and Meyer, Jeffrey G., 3,725,444.
Meyerson, Norman L., to Worthington Corporation. Visual display board. 3,724,110, Cl. 40-28.00c.
Meylan, Charles D.: *See—*
Varnum, Gordon D.; and Meylan, Charles D., 3,724,819.
Michael, Wolfgang: *See—*
Munch, Werner; and Michael, Wolfgang, 3,724,364.
Michaels, Ronald: *See—*
Mayes, Nathan; Green, Joseph E.; and Michaels, Ronald, 3,725,374.
Michel, Donald E.: *See—*
Mc Keown, James E.; Gregoire, Stephen E.; and Michel, Donald E., 3,725,844.
McKeown, James E.; and Michel, Donald E., 3,725,853.
Michelin, Marcel M. E. Wide web recorder with incremental tape transport and multiple transversally scanning heads. 3,725,605, Cl. 179-100.20t.
Michio, Kikuchi: *See—*
Masumoto, Hakaru; Sawaya, Shohachi; and Michio, Kikuchi, 3,725,053.
Mickelson, Grant A.: *See—*
Hass, Robert H.; Mickelson, Grant A.; Baral, William J.; Reeg, Cloyd P.; Attane, Edward C., Jr.; and Jones, Darryl L., 3,725,243.
Micro & Precision Mouldings (Cheltenham) Limited: *See—*
James, Michael Joseph, 3,724,888.
Micro Science Associates: *See—*
Uchytil, Gary, 3,725,215.
Microdry Corporation, mesne: *See—*
Johnson, Ray M., 3,725,628.
Mielke, Bodo, to Roller-Werke Franke & Heidecke. Electromagnetic drive for photographic shutters. 3,724,350, Cl. 95-53.00e.
Mikulyak, Robert Michael, to Bell Telephone Laboratories, Incorporated. Method of regrowing crystals of cadmium sulphide for scintillation counters. 3,725,008, Cl. 23-294.000.
Mileahead Industries Incorporated: *See—*
Miller, Marvin, 3,723,999.
Millar, Huntley D., to Millar Instruments, Inc. Physiological pressure transducers. 3,724,274, Cl. 73-398.0ar.
Millar Instruments, Inc.: *See—*
Millar, Huntley D., 3,724,274.
Miller, Alfred H.: *See—*
Roetter, Robert P.; Miller, Alfred H.; and Quinn, John D., 3,725,026.
Miller, Charles H.; Broadt, David R.; and Armstrong, Donald E., to GTE Sylvania Incorporated. Photographic flashlamp unit. 3,725,692, Cl. 240-1.300.
Miller, Donald L., to Bendix Corporation, The. Self-adjusting electromagnetic clutch-brake. 3,724,619, Cl. 192-81.00b.
Miller, Edward Francis: *See—*
Pountney, Clifford Harold; and Miller, Edward Francis, 3,725,131.
Miller, Elton W. Protective building structure. 3,725,891, Cl. 340-273.000.
Miller, Marvin, to Mileahead Industries Incorporated. Portable waste disposal unit. 3,723,999, Cl. 4-142.000.
Miller, Paul G.; Hsinchu, Taiwan; and Griffith, Francis C., to Rogers Brothers Company. Dehydrated potato pieces. 3,725,087, Cl. 99-207.000.
Miller, Robert E.: *See—*
Buchholz, Donald E.; Bakala, Ronald L.; Miller, Robert E.; and Pickering, Richard W., 3,725,912.
Mills, Harry N.; and Roll, Henry E., to Owens-Illinois, Inc. Method of feeding glass batch. 3,725,022, Cl. 65-27.000.
Mindrill Limited: *See—*
Koepke, Horst, 3,724,568.
Minnesota Mining and Manufacturing Company: *See—*
Fraik, Robert D., 3,725,104.
Haller, Willis D.; and Colline, Raymond M., 3,725,126.
Peterson, Stanley G., 3,724,047.
Shevlin, Thomas S., 3,725,645.
Smead, David E., 3,725,646.
Thom, Karl F., 3,725,296.
Minolta Camera Kabushiki Kaisha: *See—*
Matsumoto, Toshiaki, 3,724,351.
Yamazaki, Keiji, 3,724,345.
Mintz, Milton S., to United States of America, Interior. Dynamically formed electrodialysis membranes. 3,725,235, Cl. 204-180.00p.
Miram, Oleg V. Method of multi-level building construction. 3,724,157, Cl. 52-745.000.
Misencik, John J., to Westinghouse Electric Corporation. Differential transformer mounting arrangement particulary for ground fault interrupter apparatus. 3,725,741, Cl. 317-18.00d.
Miskin, Richard B., to Baled hay loading machine. . 3,724,634, Cl. 198-7.0bl.
Missouri Engineering Corporation: *See—*
Lemberger, Robert A.; and Gilmore, Jerry L., 3,724,664.
Mita Industrial Company Limited: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,725,066.
Mitchell, James: *See—*
Nicholson, Bruce; and Mitchell, James, 3,724,037.
Mitich, Stephen R., to Masco Corporation. Humidifier. 3,724,824, Cl. 261-92.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Kawamoto, Susumu; and Suzuki, Hisao, 3,725,212.
Mitsubishi Kinzoku Kogyo Kabushiki Kaisha: *See—*
Morisaki, Toshikazu; and Tachimoto, Kazuo, 3,725,044.
Mitsubishi Pencil Co., Ltd.: *See—*
Hashimoto, Yasuyuki; and Torii, Osamu, 3,724,960.
Mitsubishi Rayon Co., Ltd.: *See—*
Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Mukai, Takuma; Nakazima, Atushi; and Sakunaga, Kenichi, 3,724,038.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Kawai, Tadashi; and Kenma, Hideaki, 3,725,043.
Mitsui Toatsu Chemicals Incorporated: *See—*
Otsuka, Eiji; Kanai, Kazumichi; Inoue, Shigeru; and Hashimoto, Novuyoshi, 3,725,210.
Miura, Taro; Nakamura, Kiichi; and Hashimoto, Tadashi, to T.D.K. Electronics Company, Ltd. Stripline circulator biased by a plurality of small pole pieces. 3,725,823, Cl. 333-1.100.
Miyadera, Yasuo; Masuko, Tatuo; Muroi, Tadashi; Noguchi, Hiroshi; and Kawashima, Hideo. Crosslinked copolymers of aromatic diaminodiames, aromatic diahydrides and aromatic diamines and method of preparation. 3,725,344, Cl. 260-47.0cp.
Miyamoto, Shinzo: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,724,726.
Mizuhata, Yasuo: *See—*
Suzuki, Seiya; Mizuhata, Yasuo; Kinoshita, Kunihiko; and Godo, Takanobu, 3,725,391.
MI2, Inc.: *See—*
Manson, Edwin E., 3,724,630.
Mobil Oil Corporation: *See—*
Allen, Paul T.; Drinkard, B. M.; and Unger, Edward H., 3,724,170.
Armstrong, Eldon L., 3,725,279.
Baum, Lester A. H., 3,725,240.
Brennan, James A., 3,725,498.
Gough, Stanley T. D., 3,725,511.
Kelly, John, Jr., 3,724,565.
Lake, Connie, 3,724,921.
Messenger, Joseph U., 3,724,564.
Napier, Roger P., 3,725,550.
Snavely, Earl S., Jr., 3,724,552.
Snavely, Earl S., Jr.; Bertness, Theodore A.; and Morris, Richard L., 3,724,553.
Mochimaru, Hideaki: *See—*
Sugita, Keiji; Mochimaru, Hideaki; and Watanabe, Toshio, 3,724,944.
Mogensen, Erik: *See—*
Wrisberg, Johannes; Andersen, Kjeld Jorn; and Mogensen, Erik, 3,725,495.
Mohon, Windell N.; and Rodemann, Alfred N., to United States of America, Navy. Laser speckle visual tester. 3,724,933, Cl. 351-36.000.
Moist O'Matic; division of Toro Manufacturing: *See—*
Hu nter, Edwin J., 3,724,757.
Molimard, Robert, to Laboratoires Jacques Logeais. Peristaltic pump. 3,724,974, Cl. 417-477.000.
Molino, Angelo R. Rolling and beading machine. 3,724,250, Cl. 72-171.000.
Molino, Angelo R. Duct forming apparatus. 3,724,255, Cl. 72-306.000.
Molins Limited: *See—*
Davies, Robert William, 3,725,181.
Moller, Hermann: *See—*
Andres, Rudolf; Stolz, Albert; and Moller, Hermann, 3,724,752.
Molyneux, George; and Molyneux, George Walter. Anchorages for track rails. 3,724,754, Cl. 238-349.000.
Molyneux, George Walter: *See—*
Molyneux, George; and Molyneux, George Walter, 3,724,754.
Mona Industries, Inc.: *See—*

Messerschmidt, Harold J.; Heyman, Karl; and Johnsen, Bernadou W., II, 3,725,159.
Messerschmidt, Harold J., Jr.; Heyman, Karl; and Johnsen, Bernadou W., II, 3,725,158.

Mongeon, Robert J.: *See—*
Mack, Michael E.; and Mongeon, Robert J., 3,725,733.

Moniak, John; and Bridenbaugh, Edwin R., to International Telephone and Telegraph Corporation. Loudspeaking telephone station circuit. 3,725,585, Cl. 179-1.0hf.

Monks, David E., to Eastman Kodak Company. Means for preventing film movement in a camera. 3,724,348, Cl. 95-31.00r.

Monsanto Chemicals Limited: *See—*
Weight, Donald, 3,724,105.

Monsanto Company: *See—*
Armstrong, Luther W.; and Rollings, William A., 3,724,199.
Chamberlin, John M., 3,725,378.
Gidge, Lester, 3,725,189.
Groves, Warren Olley; Herzog, Arno Henry; and Craford, Magnus George, 3,725,749.
Wheeler, Clayton A., 3,724,986.

Montblanc-Simplo GmbH: *See—*
Herrnring, Heinz Gunther, 3,724,962.

Montecatini Edison S.p.A.: *See—*
Pieri, Giovanni; Aldo, Novara; Held, Llewellyn John; and Bedetti, Gianfranco, 3,725,526.

Montgomery, Lionel C., to Union Carbide Corporation. Boron nitride containing vessel having a surface coating of zirconium silicon. 3,724,996, Cl. 263-47.00r.

Moody, Paul E., to United States of America, Navy. Submarine outboard greasing system. 3,724,600, Cl. 184-70.000.

Moore, Francis C.; and Perkinson, Leon R., to Moore-Perk Corporation. Method of sterile packaging. 3,725,003, Cl. 21-58.000.

Moore, Robert P., to United States of America, Navy. Automatic integrator control for radiometric guidance. 3,725,931, Cl. 343-100.0me.

Moore, William Ross; and Langner, Ralph Rolland, to Dow Chemical Company, The. Fabrics sized with copolymers of sulfur dioxide and allyl epoxyalkane ethers. 3,725,125, Cl. 117-139.50a.

Moore, William S. Spindle assembly for textile machine. 3,724,195, Cl. 57-75.000.

Moore-Perk Corporation: *See—*
Moore, Francis C.; and Perkinson, Leon R., 3,725,003.

Moreau, Jean Pierre; and Boudry, Jean Marie, to Sescosem-Societe Europeenne de Semiconducteurs et de Microelectronique. Divider circuits. 3,725,791, Cl. 328-41.000.

Morey, Edward F.: *See—*
Harris, Robert H.; and Morey, Edward F., 3,725,263.

Morgan, Ian H., to Texas Instruments, Incorporated. Junction field effect transistor and method of fabrication. 3,725,136, Cl. 148-1.500.

Morgese, Nicholas V., to Continental Can Company, Inc. Blister pack carrier. 3,724,653, Cl. 206-65.00r.

Mori, Takasuke: *See—*
Narita, Kiichi; Mori, Takasuke; and Itoo, Takamichi, 3,724,528.

Morikawa, Hiroyasu: *See—*
Horiie, Shigeki; Morikawa, Hiroyasu; Fujii, Chiyuki; Kobayashi, Teruo; Kohno, Susumu; and Ono, Toru, 3,725,443.

Morisaki, Toshikazu; and Tachimoto, Kazuo, to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha. Method of continuous processing of sulfide ores. 3,725,044, Cl. 75-74.000.

Morris, Richard L.: *See—*
Snavely, Earl S., Jr.; Bertness, Theodore A.; and Morris, Richard L., 3,724,553.

Morrison, Glenn C.; Shavel, John, Jr.; and Cetenko, Wiaczeslaw, to Warner-Lambert Company. Pyridyl-β-hydroxysulfoxides and sulfones and derivatives. 3,725,420, Cl. 260-294.80f.

Morrison, Robert C.; and Kamienski, Conrad W., to Lithium Corporation. Preparation of polymers. 3,725,368, Cl. 260-84.700.

Morrissey, James P.; and Mac Donald, Donald J., to United States of America, Air Force. Spinning radiosonde configuration. 3,724,271, Cl. 73-336.000.

Morton, Allen Russell. Portable light holder for camper's gas lamp. 3,725,696, Cl. 2 40-84.000.

Morton, Bernard W.; and Morton, Willard E., to Environmental Industries, Inc. Steam humidifier with centrifugal separator. 3,724,180, Cl. 55-410.000.

Morton, Willard E.: *See—*
Morton, Bernard W.; and Morton, Willard E., 3,724,180.

Moser, James R.; and Schneider, Alan A., to Catalyst Research Corporation. Solid state thermally active battery. 3,725,132, Cl. 136-90.000.

Moss, Charles W. Air-drop folding portable shelter. 3,724,473, Cl. 135-4.00r.

Moss, Gene D.: *See—*
Vogelhuber, Fred W.; Vogelhuber, Heather; and McMillan, Gilman C., 3,724,677.

Motor Wheel Corporation: *See—*
Gurney, Chester T.; and Gatti, Arnold P., 3,724,442.

Motorola, Inc.: *See—*
Frederiksen, Thomas M.; and Russell, Ronald W., 3,725,673.
Frederiksen, Thomas M., 3,725,681.
George, William L., 3,725,150.
Griffey, Donald E., 3,725,739.
Gunderson, Philip D.; and Freimark, Ronald J., 3,725,583.
Olah, Emery E., 3,724,280.
Schaeffer, Dennis R.; and Wright, Larry R., 3,725,674.
Zoroglu, Demir S., 3,725,151.

Motoyoshi, Kenya: *See—*
Honda, Sochiro; Hagiwara, Yoshitoshi; and Motoyoshi, Kenya, 3,725,048.

Mott, Lambert H. Sealing method. 3,724,064, Cl. 29-520.000.

Moulin, Robert L., to Hughes Aircraft Company. Environment proof connector. 3,725,845, Cl. 339-49.00r.

Mouret, Gerard Marcel. Stain removing composition. 3,725,289, Cl. 252-95.000.

Moy, Bertram K.: *See—*
McCulloch, Charles R.; Moy, Bertram K.; and Randle, Thomas C., 3,725,154.

Mucka, John R.: *See—*
Brevko, Robert; Bitsura, Michael P.; Mucka, John R.; and Zinski, Peter, 3,724,164.

Mueller, Alfred: *See—*
Reinhard, Hans; Mueller, Alfred; and Dotzauer, Bernhard, 3,725,122.

Mueller, Francis X., Jr.; and Brown, James D., to Phillips Petroleum Company. Polymerization initiator of organoalkaline earth compound with organoaluminum compound. 3,725,301, Cl. 252-431.00r.

Mukai, Kunio: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.

Mukai, Takuma: *See—*
Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Mukai, Takuma; Nakazima, Atushi; and Sakunaga, Kenichi, 3,724,038.

Mullen, Daniel J., Jr., to Penn Novelty Co. Color change mechanism for an embroidering machine. 3,724,405, Cl. 112-221.000.

Muller, Erwin: *See—*
Wirth, Wolf-Dieter; Muller, Erwin; Blahak, Johannes; and Rohr, Harry, 3,725,321.

Muller, Horst: *See—*
Weisfeld, Lewis B.; Andreas, Holger; and Muller, Horst, 3,725,338.

Muller, Wolfgang; and Munding, German, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Fuel system, in particular for rocket engines. 3,724,213, Cl. 60-39.270.

Multi-Point Tool Co., Inc.: *See—*
MacKelvie, Philip A., 3,724,301.

Munch, Walter, Jr.; and Studer, Richard L., to Baldwin, D. H., Company. Arpeggio system for electronic organ. 3,725,562, Cl. 84-1.240.

Munch, Werner; and Michael, Wolfgang, to Schuler, L., GmbH. Press framework. 3,724,364, Cl. 100-214.000.

Munding, German: *See—*
Muller, Wolfgang; and Munding, German, 3,724,213.

Munzel, Howard E.: *See—*
Fuller, Sterritt R., Jr.; Munzel, Howard E.; and Woosley, Kenneth D., 3,725,118.

Murakami, Keiichi: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Hirakawa, Michio, 3,725,336.

Murayama, Yoshimasa, to Hitachi, Ltd. Multilayer wiring structure. 3,725,743, Cl. 317-101.00a.

Muroi, Tadashi: *See—*
Miyadera, Yasuo; Masuko, Tatuo; Muroi, Tadashi; Noguchi, Hiroshi; and Kawashima, Hideo, 3,725,344.

Muroi, Tadashi; Oguri, Yoshitaka; and Ishida, Masahiko, to Hitachi, Ltd. Method of recovering proteins from microbial cells. 3,725,075, Cl. 99-14.000.

Murphree, Francis J.; Kennedy, Peter D.; and Webster, Richard B., to United States of America, Navy. System for determining direction of arrival of signals. 3,725,855, Cl. 340-6.00r.

Murphy, James F.: *See—*
Pearson, Michael J.; Olsen, Orrie C.; and Murphy, James F., 3,725,531.

Murphy, John P., to Lubrizol Corporation, The. Acylating agents, their salts, and lubricants and fuels containing the same. 3,725,441, Cl. 260-400.000.

Murphy, John S.: *See—*
Balogh, Edward, Jr.; Bennett, James Russell; Keenan, William F.; Logan, William A.; and Murphy, John S., 3,725,872.

Murphy, Joseph, to Westinghouse Electric Corporation. Laser and fluorescent crystalline materials. 3,725,811, Cl. 331-94.500.

Murthy, Nanjundiah Narasimha; Macura, Joseph Steven; Gergely, William, Jr.; and Berg, Allen Charles, to Pitney-Bowes Alpex, Inc. High-speed parallel printer. 3,724,366, Cl. 101-93.00c.

Musolf, Martin C.: *See—*
Campbell, James K.; and Musolf, Martin C., 3,725,000.

Mutchler, Paul A., to American Air Filter Company, Inc. Burner assembly. 3,724,995, Cl. 431-352.000.

Muto, Katsuya; and Kawashima, Yoshichi, to Nippondenso Kabushiki Kaisha. Temperature control system for a car cooler. 3,724,230, Cl. 62-133.000.

Myers, H. George: *See—*
Dorsey, Robert L., Sr.; Gross, James C.; and Myers, H. George, 3,725,834.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,725,412.
Nagahama, Shizuo; Shimada, Keizo; and Kurozumi, Seizi, to Teijin Limited. Process for separating dimethyl naththalenes comprising 2,6-dimethyl naphthalene as main component. 3,725,490, Cl. 260-674.00n.
Nagata, Senichi; Ogawa, Oyuki; and Hobo, Nobuhito, to Nippondenso Co., Ltd. Fuel feed control device for internal combustion engines. 3,724,436, Cl. 123-139.00e.
Nagoya, Tsutomu; Fujima, Yoshito; and Shimizu, Yoichi, to Sankyo Chemical Industries Limited. Process for the preparation of α-hydroxy-β-phenypropionic acid derivatives and alkalimetal-or ammonium salts thereof. 3,725,437, Cl. 260-340.500.
Nagy, Robert P.: *See—*
Lagally, Paul; and Nagy, Robert P., 3,724,919.
Naismith, Thomas D.; and Shellhause, Ronald L., to General Motors Corporation. Disc brake with integral parking brake. 3,724,605, Cl. 188-71.800.
Naive, Joel A.; and Van Benschoten, Peter J., Wavetek. Potentiometric measuring device with multiple stage counter mechanism. 3,725,782, Cl. 324-98.000.
Nakai, Kenichi; and Yamashita, Takehiko, to Matsushita Electric Works, Ltd. Flickerless three-phase lighting device for electric discharge lamps. 3,725,730, Cl. 315-144.000.
Nakajimatokyo, Mituo: *See—*
Ohmori, Kaour; Nakajimatokyo, Mituo; Ishida, Shuichi; and Yamada, Osamu, 3,725,445.
Nakamura, Kiichi: *See—*
Miura, Taro; Nakamura, Kiichi; and Hashimoto, Tadashi, 3,725,823.
Nakamura, Kozo: *See—*
Suzuki, Shigemasa; and Nakamura, Kozo, 3,725,520.
Nakamura, Sunichi: *See—*
Nakano, Satoshi; Azuma, Keiichi; Oba, Seiichiro; Wakizaka, Samon; and Nakamura, Sunichi, 3,725,507.
Nakano, Satoshi; Azuma, Keiichi; Oba, Seiichiro; Wakizaka, Samon; and Nakamura, Sunichi, 1/2 to Tokuyama Soda Kabushiki Kaisha and 1/2 to Sun Arrow Chemical Co., Ltd. Process for the preparation of vinyl chloride graft polymers. 3,725,507, Cl. 260-896.000.
Nakaoka, Kazuhide: *See—*
Kubotera, Haruo; Nakaoka, Kazuhide; Araki, Kenji; and Kurihara, Takao, 3,724,826.
Nakazima, Atushi: *See—*
Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Mukai, Takuma; Nakazima, Atushi; and Sakunaga, Kenichi, 3,724,038.
Nakazono, Ryuichi: *See—*
Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Mukai, Takuma; Nakazima, Atushi; and Sakunaga, Kenichi, 3,724,038.
Nakazyo, Kiyoshi: *See—*
Yoshida, Makoto; Tsuda, Momotoshi; Oishi, Yasushi; and Nakazyo, Kiyoshi, 3,725,072.
Nalco Chemical Company: *See—*
Bott, Lawrence L., 3,724,547.
Shepard, John C., Jr., 3,725,447.
Troscinski, Edwin S.; and Stanford, James R., 3,724,551.
Nambu, Shyuya; and Aono, Shigeo, to Nissan Motor Company, Limited. Intake air control device for internal combustion engine of fuel injection type. 3,724,822, Cl. 261-43.000.
Nanninga, William W.: *See—*
Alberti, John; and Nanninga, William W., 3,724,022.
Napier, Roger P., to Mobil Oil Corporation. Pyrrole derivative fungidical agents and treatments. 3,725,550, Cl. 424-274.000.
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Yamazaki, Osami; and Fukudi, Hideo, to Takeda Chemical Industries, Ltd. Method for separating citric acid. 3,725,474, Cl. 260-535.00p.
Narita, Kiichi; Mori, Takasuke; and Itoo, Takamichi, to Kobe Steel, Ltd. Method for manufacturing of sound killed steel ingots. 3,724,528, Cl. 164-58.000.
Nasutavicus, Wilmonte A.: *See—*
Johnson, Francis; and Nasutavicus, Wilmonte A., 3,725,401.
National Beryllia Corporation: *See—*
Lynch, John F., 3,725,186.
National Blank Book Company, Inc.: *See—*
Krikorian, Albert P., 3,724,876.
National Can Corporation: *See—*
Zundel, Arthur P., 3,724,727.
National Cash Register Company, The: *See—*
Hilbelink, Ronald D.; and Peters, Gavin H., 3,725,501.
National Central Bank of York Pennsylvania; Administrator: *See—*
Grote, George A., 3,724,177.
National Central Bank of York Pennsylvania; Administrator, d.b.n.c.t.a. of the estate of Beach, Willard C.; deceased and Administrator c.t.a. of the estate of Beach, Mary B.: *See—*
Grote, George A., 3,724,177.
National Distillers and Chemical Corporation: *See—*
Robinson, Robert E., 3,725,463.
National-Standard Company: *See—*
Lang, Ernest U., 3,724,977.
Naumann, Gunter; Schon, Nikolaus; Schnoring, Hildegard; and Pampus, Gottfried, to Bayer Aktiengesellschaft. Suspension stabilizers. 3,725,313, Cl. 260-2.10r.
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich. Plasmatron drive. 3,725,559, Cl. 13-14.000.
Neary, Michael P., to Beckman Instruments, Inc. Demountable sample cell holder and cell for liquid scintillation counters. 3,724,956, Cl. 356-246.000.
Needham, Andrew W., Jr. Multiple stop for power tools. 3,724,964, Cl. 408-14.000.
Neeff, Rutger: *See—*
Gehrke, Gunter; Hederich, Volker; Neeff, Rutger; and Wegner, Peter, 3,724,998.
Negrou, Jacques: *See—*
Barrot, Jean-Pierre; Negrou, Jacques; and Pelte, Charles, 3,725,785.
Nelson, Douglas Carlyle; and Knaggs, Edward Andrew, to Stepan Chemical Company. Oxyacetic acid compounds as builders for detergent compositions. 3,725,290, Cl. 252-110.000.
Nelson, Forrest A., to Varian Associates. RF spectrometer having means for exciting RF resonance of a plurality of resonance lines simultaneously using a high speed scanning means. 3,725,773, Cl. 324-.5ac.
Nelson, John W., to Upjohn Company, The. Prostanoic acid derivatives. 3,725,469, Cl. 260-514.00d.
Nelson, Lloyd A., to Gerber Products Company. Glass jar handling system. 3,724,686, Cl. 214-8.50a.
Nelson, Nicholas R. Adjustable socket. 3,724,299, Cl. 81-128.000.
Nelson, William B., to Ames Rubber Corporation. Apparatus for making rolls. 3,724,983, Cl. 425-129.000.
Nepela, Daniel A. Variable contrast image projection. 3,724,938, Cl. 353-20.000.
Nereid N.V.: *See—*
Lok, Harmannus Henderikus, 3,724,410.
Neudecker, Joseph W.; and Cooper, Kenneth C., to United States of America, Atomic Energy Commission. Decomposed ammonia radioisotope thruster. 3,724,215, Cl. 60-203.000.
Neumann, Henning: *See—*
Federer, Fritz; and Neumann, Henning, 3,724,497.
Neville, Roy G., to Bechtel International Corporation. Thermally stable polyindanyl polymers derived from phenylene oxides and process for making the same. 3,725,346, Cl. 260-47.0ua.
Nevyas, Herbert J.; and Klein, Wilfred. Lighting system control for ophthalmic examinations. 3,724,931, Cl. 351-1.000.
Newallis, Peter E.; Poje, Albert J.; and Epstein, Peter F., to Chemagro Corporation. Limited plant growth with heterocyclic alkylthiocyante and isothiocyante. 3,725,030, Cl. 71-76.000.
Newbold, Geoffrey Tattersall: *See—*
Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert, 3,725,554.
Nichols, Matthew, to Sauter Packaging Company. Apparatus for inserting tablets into blister packages. 3,724,165, Cl. 53-250.000.
Nichols, Matthew, to Sauter Packaging Company. Punch and die cutout station. 3,724,308, Cl. 83-557.000.
Nicholson, Bruce; and Mitchell, James, to T.M.M. (Research) Limited. Processes and apparatus for crimping synthetic filamentary materials. 3,724,037, Cl. 28-1.600.
Nielsen Engineering & Research, Inc.: *See—*
Schwind, Richard G., 3,724,276.
Niezoldi & Kramer GmbH: *See—*
Leistner, Rudolf; Roth, Johann; and Renndorfer, Alfred, 3,724,936.
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, to Mita Industrial Company Limited. Diazo-type multicolor reproduction process. 3,725,066, Cl. 96-49.000.
Niklas, Ludwig. Method for adjusting swept gain on ultrasonic pulse-echo instruments for uniform sensitivity, irrespective of flaw depth. 3,724,262, Cl. 73-67.800.
Niles, Eart T.; and Stevens, Don L., to Dow Chemical Company, The. Polymeric binders for use in hybrid rocket propellents. 3,725,152, Cl. 149-19.000.
Nippendenso Co., Ltd.: *See—*
Okamoto, Atsutoshi; and Sugiura, Akio, 3,724,903.
Nippon Ekiki Seikei Kibushiki Kaisha: *See—*
Suzuki, Shigemasa; and Nakamura, Kozo, 3,725,520.
Nippon Electric Company, Limited: *See—*
Furuhashi, Tokio, 3,725,754.
Yasudi, Susumu; and Sato, Norio, 3,725,813.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Yamada, Takashi; and Matsumoto, Toyosaku, 3,724,312.
Nippon Kayaku Co., Ltd.: *See—*
Ohmori, Kaour; Nakajimatokyo, Mituo; Ishida, Shuichi; and Yamada, Osamu, 3,725,445.
Nippon Kayaku Company, Ltd.: *See—*
Maezawa, Shiro; Yoshikawa, Hiroshi; Sakamoto, Kenji; Fujii, Jun; and Hashimoto, Makoto, 3,725,208.
Nippon Kogaku K.K.: *See—*
Shimomura, Jun, 3,724,352.
Nippon Kokan Kabushiki Kaisha: *See—*
Kubotera, Haruo; Nakaoka, Kazuhide; Araki, Kenji; and Kurihara, Takao, 3,724,826.
Sugawara, Tsunenori; and Mase, Jiro, 3,724,689.
Nippon Oil Company, Limited: *See—*
Yamada, Shoji, 3,725,253.
Nippon Steel Corporation: *See—*
Satoh, Susumu; Tanaka, Hideki; Ono, Shujiro; and Horiguchi, Hiroshi, 3,725,049.
Nippondenso Co., Ltd.: *See—*
Nagata, Senichi; Ogawa, Oyuki; and Hobo, Nobuhito, 3,724,436.

Tanasawa, Yasusi; Inoue, Tokuta; and Ishiguro, Kenji, 3,724,220.
Yamaguchi, Terumoto; and Amano, Yoshinao, 3,724,538.

Nippondenso Kabushiki Kaisha: *See—*
Matsui, Kazuma; and Tsubouchi, Hideo, 3,724,504.
Muto, Katsuya; and Kawashima, Yoshichi, 3,724,230.
Shirai, Takeaki; Kato, Masumi; and Oshikawa, Kiyomitsu, 3,724,133.
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, 3,724,293.
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, 3,724,295.

Nishimiya, Yutaka: *See—*
Oushige, Takayoshi; Kinoshita, Yukio; Iizuka, Kikuo; and Nishimiya, Yutaka, 3,725,808.

Nishimoto, Kazuyuki: *See—*
Wada, Mitsuo; Nishimoto, Kazuyuki; Aoki, Masaki; and Iida, Yoshio, 3,725,836.

Nishimura, Kenji: *See—*
Yamada, Keisho; Nishimura, Kenji; Furusaki, Shinichi; Toshimitsu, Tatsuo; and Inaba, Yukio, 3,725,459.

Nishizawa, Hitoshi: *See—*
Shirato, Akira; Nishizawa, Hitoshi; and Sawada, Seizo, 3,725,330.

Nishizawa, Yoshihiko: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.

Niss, Erik, to AGA Aktiebolag. Optical instrument for determining the distance between two measuring points. 3,724,950, Cl. 356-3.000.

Nissan Motor Company, Limited: *See—*
Nambu, Shyuya; and Aono, Shigeo, 3,724,822.

Nitkovskikh, Anatoly Anatolievich: *See—*
Kavepa, Alexandr Alexandrovich; Nitkovskikh, Anatoly Anatolievich; Grigoriev, Vladimir Andreevich; Pashkov, Arkady Borisovich; and Epshtein, Yakov Vulfovich, 3,725,013.

Nitschke, Robert O., to Greene, Ted J. Cervical brace. 3,724,452, Cl. 128-75.000.

Nitto Chemical Industry Co., Ltd.: *See—*
Suyama, Fujio; Yamamoto, Tokuo; Shimono, Kenichi; Kuwahara, Hirosi; Ishii, Masao; and Watanabe, Ichiro, 3,725,195.

Nixon, Charles Roy: *See—*
Nixon, Charles Roy; and Gasafi, Anton, 3,724,904.

Nixon, Charles Roy; and Gasafi, Anton, to Nixon, Charles Roy. Wheel balancing device. 3,724,904, Cl. 301-5.0ba.

Nobel, Fred I.: *See—*
Kessler, Richard B.; and Nobel, Fred I., 3,725,220.

Noguchi, Hiroshi: *See—*
Miyadera, Yasuo; Masuko, Tatuo; Muroi, Tadashi; Noguchi, Hiroshi; and Kawashima, Hideo, 3,725,344.

Noha, Klaus: *See—*
Voigt, Hartman; Schneck, Erich; Gunther, Klaus; and Noha, Klaus, 3,725,491.

Nolan, Thomas E., to RCA Corporation. High power laser system. 3,725,817, Cl. 331-94.500.

Nolan, William J., Jr.; and Alpers, Frederick C., to United States of America, Navy. Discriminatory missile guidance system. 3,724,783, Cl. 244-3.150.

Nolin, Richard: *See—*
Huettner, Robert E.; Tymann, Edward B.; and Nolin, Richard, 3,725,871.

Noll, Walter: *See—*
Golitz, Hans Dietrich; Merten, Rudolf; Noll, Walter; and Simmler, Walter, 3,725,449.

Nolt, Edwin B., to Sperry Rand Corporation. Feed mechanism for a crop baler. 3,724,363, Cl. 100-189.000.

Nongbri, Govanon: *See—*
Alpert, Seymour B.; Wolk, Ronald H.; Chervenak, Michael C.; and Nongbri, Govanon, 3,725,251.

North American Rockwell Corporation: *See—*
Ischer, John J., 3,724,923.

Northern Fibre Products Company: *See—*
Ambrose, Jere B., 3,724,009.

Northern Natural Gas Company: *See—*
Frantzen, Karl H., 3,724,403.

Northrop, John H.; Jones, Eugene C.; Sioles, George W.; and Mellette, Gary W., to Mattel, Inc. Optical disc drive for organ. 3,724,860, Cl. 274-9.00b.

Norton Company: *See—*
Rechberger, Franz F., 3,724,160.
Weaver, Gerald Q., 3,725,015.

Notari, Gennaro V.; and Rickert, Royce J., to Combustion Engineering, Inc. Nuclear reactor organization and fuel assembly arrangement. 3,725,199, Cl. 176-61.000.

Notko, Michael F.; and Hylak, Peter J., to Sears, Roebuck and Co. Knockdown table. 3,724,399, Cl. 108-157.000.

Nouchy, Claude. Process for the manufacture of synthetic leather material. 3,725,171, Cl. 156-230.000.

Nozik, Arthur Jack; Tribit, Samuel; and Williams, Ferd E., to American Cyanamid Company. White silicon carbide solids. 3,725,099, Cl. 106-288.00b.

Nuclear-Chicago Corporation: *See—*
Laney, Barton H., 3,725,657.

Nupnau, Irthur E., to Bell & Howell Company. Film reel support assembly for projectors. 3,724,775, Cl. 242-180.000.

Nurmohamed, Amin Mulji; and Watters, Richard, to Elliott Brothers (London) Limited. Voter circuits for three-channel redundant systems. 3,725,818, Cl. 330-124.00d.

Nutron Corporation: *See—*
Denker, James M., 3,724,334.

N.V. Foco Nederland: *See—*
Weston, William A., 3,724,698.

N.V. Leidsche Apparatenfabriek: *See—*
Van Der Meer, Leonardus Petrus, 3,724,166.

Oba, Seiichiro: *See—*
Nakano, Satoshi; Azuma, Keiichi; Oba, Seiichiro; Wakizaka, Samon; and Nakamura, Sunichi, 3,725,507.

Obermann, George, to Controls Company of America. Timer. 3,724,248, Cl. 74-122.000.

Ocean Protein Corporation: *See—*
Day, John J.; and Hirschman, Paul S., 3,724,423.

Ogata, Fumimaro: *See—*
Ando, Satoshi; Matsui, Masao; and Ogata, Fumimaro, 3,725,192.

Ogawa, Oyuki: *See—*
Nagata, Senichi; Ogawa, Oyuki; and Hobo, Nobuhito, 3,724,436.

Ogawa, Taizo: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.

Oguri, Yoshitaka: *See—*
Muroi, Tadashi; Oguri, Yoshitaka; and Ishida, Masahiko, 3,725,075.

Ohayon, Gabriel, to Societe Rhodiaceta. Device and process for the production of yarns with interlaced strands. 3,724,040, Cl. 28-1.400.

Ohkage, Masashi. Tungsten disulfide lubricant. 3,725,276, Cl. 252-25.000.

Ohmann, Friedrich; Otto, Rudolf; and Wiedenmann, Wolfgang, to Siemens Aktiengesellschaft. Method and apparatus for the production of characters at will on the picture screen of a cathode ray tube and/or on record paper. 3,725,900, Cl. 340-324.00a.

Ohmori, Kaour; Nakajimatokyo, Mituo; Ishida, Shuichi; and Yamada, Osamu, to Nippon Kayaku Co., Ltd. Double salt of zinc ethylene-bisdithiocarbamate and N-dodecylguanidine and preparation thereof. 3,725,445, Cl. 260-429.900.

Ohta, Jun: *See—*
Arai, Hiroshi; and Ohta, Jun, 3,725,858.

Ohta, Kazuhiko: *See—*
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Yamazaki, Osami; and Fukudi, Hideo, 3,725,474.

Oil States Rubber Company: *See—*
Richardson, Murl R., 3,724,337.
Richardson, Murl R., 3,724,338.

Oishi, Yasushi: *See—*
Yoshida, Makoto; Tsuda, Momotoshi; Oishi, Yasushi; and Nakazyo, Kiyoshi, 3,725,072.

Okamoto, Atsutoshi; and Sugiura, Akio, to Nippendenso Co., Ltd. Anti-skid control system for vehicles. 3,724,903, Cl. 303-21.00p.

O'Keefe, Dennis G. Rope climbing device. 3,724,593, Cl. 182-134.000.

O'Keefe, Ralph J. Semi automatic vehicle signal control device. 3,725,622, Cl. 200-61.270.

Okuno, Yositosi: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.

Olah, Emery E., to Motorola, Inc. Manual tuning apparatus for radio receiver. 3,724,280, Cl. 74-10.330.

Oldfield, Homer R., Jr.; Rawson, Edward B.; and Schwarzkopf, Daniel B., to Searle Medidata, Inc. Data communication system. 3,725,866, Cl. 340-172.500.

Olechowski, Jerome Robert, to Cities Service Company. Catalyzed molecular sizing process. 3,725,371, Cl. 260-85.30r.

Olechowski, Jerome Robert, to Cities Service Company. Oximino ketones and method for manufacturing amino acids from said ketones. 3,725,477, Cl. 260-566.00a.

Olila, Howard E., to Haskon Incorporated. Heater for sealing carton containers. 3,724,093, Cl. 34-104.000.

Olin Corporation: *See—*
Brandt, William L., 3,724,438.
Finley, Carl E., 3,724,441.

Olin, Richard Emil. Portable miniature bulb tester having bristle brushes for contacting the bulb terminals. 3,725,780, Cl. 324-51.000.

Oliversas, Jose Ma Bonastre: *See—*
Streich, Federico; Gold, Alberto Vargas; Oliversas, Jose Ma Bonastre; and Ventura, Fernando Fernandez, 3,724,311.

Olivetti, Ing., C., & C., S.p.A.: *See—*
Veneria, Giovanni Bessolo, 3,724,802.

Olliges, William E.; Polanek, Edward L.; and Gurney, Robert, to Universal Research Laboratories, Incorporated. Switching system. 3,725,759, Cl. 318-467.000.

Olmsted, Claire G.: *See—*
Olmsted, Frederick S., 3,724,844.

Olmsted, Frederick S.; deceased (by Olmsted, Claire G.; and Hartford National Bank and Trust Company; executors). Exercise stand for bicycles. 3,724,844, Cl. 272-73.000.

Olney, Frederick Darwin, Jr., to Honeywell Information Systems Inc. Controllable tensioning devices for strand material. 3,724,409, Cl. 112-255.000.

Olsen, Harry C.; Tischler, Ludwig J.; and Wernecke, Heinz C., to Jacobs, F. L., Co. Car top luggage carrier. 3,724,730, Cl. 224-42.10d.

Olsen, Harry C.; Tischler, Ludwig J.; and Wernecke, Heinz C., to Jacobs, F. L., Co. Manually operated remote control truck mirror. 3,724,928, Cl. 350-289.000.

Olsen, Orrie C.: *See—*
Pearson, Michael J.; Olsen, Orrie C.; and Murphy, James F., 3,725,531.

Olsen, Richard E., to Honeywell Information Systems Inc. Power sequencing control circuit. 3,725,675, Cl. 307-238.000.

Olsen, Willi; and Schlosser, Klaus, to Siemens Aktiengesellschaft. Gas-pressure-insulated high-voltage line. 3,725,567, Cl. 174-16.00b.

Olstowski, Franciszek: *See—*
Parrish, Donald B.; and Olstowski, Franciszek, 3,725,355.

O'Malley, James J. Pyrene containing polymers prepared by anionic polymerization. 3,725,505, Cl. 260-879.000.

Omnium de Prospective Industrielle: *See—*
Lefebvre, Michel S. M.; and Hennion, Jean-Claude M. L., 3,724,088.

Omote, Yuichi: *See—*
Yamamura, Toshio; Omote, Yuichi; Sato, Shiro; and Kani, Hiyama, 3,725,527.

Omron Tateisi Electronics Co.: *See—*
Goto, Hideyuki, 3,724,717.
Ichimori, Masuo; and Suzaki, Hideyuki, 3,724,001.

Ono, Shujiro: *See—*
Satoh, Susumu; Tanaka, Hideki; Ono, Shujiro; and Horiguchi, Hiroshi, 3,725,049.

Ono, Toru: *See—*
Horiie, Shigeki; Morikawa, Hiroyasu; Fujii, Chiyuki; Kobayashi, Teruo; Kohno, Susumu; and Ono, Toru, 3,725,443.

Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, to Gulf Research & Development Company. Process for preparing hydroxybenzoic acid. 3,725,471, Cl. 260-521.00r.

Onufry, Michael, Jr.: *See—*
Campanella, Samuel Joseph; Suyderhoud, Henri George; and Onufry, Michael, Jr., 3,725,612.

Onyx, Raymond C.: *See—*
Kiss, Emil P.; Onyx, Raymond C.; and Fegley, Richard F., 3,725,179.

Ooishi, Tadashi: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.

Opderbeck, Fritz; Ploetz, Theodor; and Wistuba, Herbert, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Copying sheet. 3,725,107, Cl. 117-36.700.

Orchard, Robert J.: *See—*
Kilmer, Charlie C.; and Orchard, Robert J., 3,725,584.

Orita, Shunji: *See—*
Kurokawa, Isao; Kzawa, Nobuyuki; and Orita, Shunji, 3,724,870.

Orlovsky, Vladimir W. Sheet folding apparatus and method. 3,724,838, Cl. 270-79.000.

Orne, Laurence E. Information enhancing amplifier. 3,725,805, Cl. 330-136.000.

Orozco, Gilbert H. Composition and method for preparing metal for cold-working. 3,725,274, Cl. 252-18.000.

Ortiz, Angel J. Control of oil pollution a sea apparatus and method. 3,724,662, Cl. 210-83.000.

Osano, Kumao. Device for tying fishing line. 3,724,034, Cl. 24-131.00c.

Oshikawa, Kiyomitsu: *See—*
Shirai, Takeaki; Kato, Masumi; and Oshikawa, Kiyomitsu, 3,724,133.

Osteo AG: *See—*
Baumann, Friedrich, 3,723,995.

Oster Corporation: *See—*
Weidner, Jack E., 3,725,642.

Ostolski, Marian J. Electrically conductive mass. 3,725,308, Cl. 252-513.000.

Ostrager, Seymour A. Spirit level with translucent spirit vial housings. 3,724,087, Cl. 33-348.000.

Oswald, Richard K., to International Business Machines Corporation. Servo positioning system for magnetic disk memory including radial runout servo compensation. 3,725,764, Cl. 318-629.000.

Otani, Kunio: *See—*
Kawase, Butaro; Kojima, Iwao; and Otani, Kunio, 3,725,530.

Oton, Edward, Jr., Ceramic Foundation, The: *See—*
Steele, Richard F., 3,724,272.

Otsuka, Eiji; Kanai, Kazumichi; Inoue, Shigeru; and Hashimoto, Novuyoshi, to Mitsui Toatsu Chemicals Incorporated. Method of removing unreacted materials remaining in urea synthesis effluent by plural stage distillation and CO_2 stripping. 3,725,210, Cl. 203-42.000.

Otsuka, Kozo, to Toitsu Kogyo Kabushiki Kaisha. System for detecting motion of a nearby target by continuous ultrasonic waves. 3,725,854, Cl. 340-1.00r.

Otto, Rudolf: *See—*
Ohmann, Friedrich; Otto, Rudolf; and Wiedenmann, Wolfgang, 3,725,900.

Oushige, Takayoshi; Kinoshita, Yukio; Iizuka, Kikuo; and Nishimiya, Yutaka, to Hitachi, Ltd. Proximity sensitive on-off transistor oscillator for controlling a relay circuit. 3,725,808, Cl. 331-65.000.

Owczarski, William A.: *See—*
Erickson, John S.; Curran, Patrick M.; and Owczarski, William A., 3,724,531.

Owens-Corning Fiberglas Corporation: *See—*
Marzocchi, Alfred; and Leary, David E., 3,725,123.
Trout, Robert G.; and Stalego, Charles J., 3,725,021.

Owens-Corning Fiberglass Corporation: *See—*
Frisch, Kurt C., 3,725,319.

Owens-Illinois, Inc.: *See—*
Heffran, Vernon C., 3,724,700.
Mills, Harry N.; and Roll, Henry E., 3,725,022.
Price, William E.; and Dullabaun, Paul W., 3,724,811.
Sanner, Richard D., 3,725,093.

Owston, William J., to Lord Corporation. Fast curing polychloroprene acrylic adhesive. 3,725,504, Cl. 260-876.00r.

Ozaki, Toshiaki: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.

Pachaly, Robert W., to Gulf Research & Development Company. LNG expander cycle process employing integrated cryogenic purification. 3,724,226, Cl. 62-39.000.

Pacific Lighting Service Co.: *See—*
Seliber, Joseph, 3,724,229.

Packard, Roger A.: *See—*
Bennett, Delora E.; and Packard, Roger A., 3,724,014.

Paco Winders, Inc.: *See—*
Kiss, Emil P.; Onyx, Raymond C.; and Fegley, Richard F., 3,725,179.

Padgitt, Kenneth W., to Borg-Warner Corporation. Rotational speed sensor. 3,725,668, Cl. 250-231.00r.

Page, Clifford Frank, to Alcan Research and Development Limited. Production of deep drawn pressings. 3,724,247, Cl. 72-60.000.

Page, Richard W. Dental operating chair. 3,724,894, Cl. 297-284.000.

Pakulak, Pete. Pillow blocks and flange cartridges. 3,724,917, Cl. 308-72.000.

Palombari, Maurizio; and Di Biago, Luciano, to Societa Italiana Telecomunicizioni Siemens S.p.A. Synchronization network for PCM multiplexing systems. 3,725,591, Cl. 179-15.0af.

Palombari, Maurizio, to Societa Italiana Telecommunicizioni Siemens S.p.A. PCM Telecommunication sytem with standby clock. 3,725,593, Cl. 179-15.0bf.

Pampus, Gottfried: *See—*
Naumann, Gunter; Schon, Nikolaus; Schnoring, Hildegard; and Pampus, Gottfried, 3,725,313.

Panish, Morton B.: *See—*
Ilegems, Marc; and Panish, Morton B., 3,725,149.

Panschow, Rudolf K. H. Digital/analog linear interpolator. 3,725,684, Cl. 235-152.000.

Panzer, Hans Peter; and Rabinowitz, Robert, to American Cyanamid Company. Polyquaternary flocculants and processes of preparing them by quaternizing alkylene polyamine resin polymer from epihalohydrin and monoalkyl amines. 3,725,312, Cl. 260-2.0bp.

Papay, Joseph, to Electrohome Limited. AGC network. 3,725,800, Cl. 330-29.000.

Paradise, William F.: *See—*
Ellerton, Norman V.; Paradise, William F.; and Sanford, Peter E., 3,725,399.

Paragon Gears Incorporates: *See—*
Benson, Carl I., Jr., 3,724,620.

Park-Ohio Industries, Inc.: *See—*
Vickers, Robert V., 3,725,629.

Parke, Davis & Company: *See—*
Capps, David B.; and Erdelyi, Alexander, 3,725,422.

Parker, Gordon M.; Wismer, Marco; and Hahn, Ernest A., to PPG Industries, Inc. Method of coating with acryloxy esters of anhydrides. 3,725,116, Cl. 117-93.310.

Parker, Harry W.; and Marx, John W., to Phillips Petroleum Company. Waterflooding method using modified starch granules. 3,724,548, Cl. 166-275.000.

Parker, John Henry; and McInerney, F. Thomas, III. Resiliently biased pilot axle arrangement. 3,724,393, Cl. 105-174.000.

Parkhill, Vernon E.; and Bruno, Marshall J., to Aluminum Company of America. Immersion heater. 3,724,447, Cl. 126-360.00r.

Parlow, Alfred M.: *See—*
Hawkins, Harold V.; Dick, Ralph A.; and Parlow, Alfred M., 3,724,815.

Parmentier, Jean Rene. Resilient instrument carrying case. 3,724,277, Cl. 73-431.000.

Parris, John L., to Carborundum Company, The. Apparatus for manipulating a workpiece. 3,724,682, Cl. 214-1.0qg.

Parris, Joseph N., to PPG Industries, Inc. Pressure molding of glass articles. 3,725,023, Cl. 65-72.000.

Parrish, Donald B.; and Olstowski, Franciszek, to Dow Chemical Company, The. Rapid setting polyurethane elastomer compositions. 3,725,355, Cl. 260-77.5ap.

Parshin, Alexei Nikolaevich: *See*—
Makachev, Nikolai Ivanovich; and Parshin, Alexei Nikolaevich, 3,724,514.

Parsons, Les & Sons (Engineers) Limited: *See*—
Parsons, Leslie Arthur, 3,724,362.

Parsons, Leslie Arthur, to Parsons, Les & Sons (Engineers) Limited. Article feeding and treating apparatus. 3,724,362, Cl. 99-516.000.

Pascoe, Frank T., to Westinghouse Air Brake Company. Train detection system for railroad grade crossing. 3,725,699, Cl. 246-114.000.

Pashkov, Arkady Borisovich: *See*—
Kavepa, Alexandr Alexandrovich; Nitkovskikh, Anatoly Anatolievich; Grigoriev, Vladimir Andreevich; Pashkov, Arkady Borisovich; and Epshtein, Yakov Vulfovich, 3,725,013.

Pasinski, Arthur M., to Burroughs Corporation. Print drum clamp. 3,724,367, Cl. 101-110.000.

Patchett, Arthur A.; and Windholz, Thomas B., to Merck & Co., Inc. 13-Carbocyclic-3-keto-4-gonenes. 3,725,439, Cl. 260-397.400.

Patmore, Edwin L.; Siegart, William R.; and Chafetz, Harry, to Texaco Inc. Carboxylation of cyclopentadiene. 3,725,468, Cl. 260-514.00g.

Patterson, William C.: *See*—
George, Daniel J.; and Patterson, William C., 3,724,711.

Patula, Edward J.; Roberts, William L.; and Somers, Robert R., to United States Steel Corporation. Method for increasing the heating rate in continuous annealing processes. 3,725,140, Cl. 148-12.100.

Paucksch, Heinrich; Massonne, Joachim; Bohm, Horst; and Fernschild, Gunter, to Kali-Chemie Aktiengesellschaft. Process of preparing fluorine containing perhalogencarboxylic acid fluorides or chlorides. 3,725,475, Cl. 260-544.00f.

Paukulis, Visvaldis. Industrialized building construction. 3,724,143, Cl. 52-79.000.

Paul, Alfred L.: *See*—
Sels, Wally O.; and Paul, Alfred L., 3,724,801.

Paul, Les, to Gibson, Inc. Method of electrically reproducing music and improved electrical pickup for practicing the same. 3,725,561, Cl. 84-1.150.

Paulsen, Glen E.: *See*—
Engler, Joseph P.; and Paulsen, Glen E., 3,724,719.

Paulus, Rudolf, to Agfa-Gevaert Aktiengesellschaft. Apparatus for determination of exposure values for color printing. 3,724,947, Cl. 355-38.000.

Pauw, Daniel R.: *See*—
Smith, Leon; Calvert, David W.; Robert, Andre; Viallet, Andre; and Pauw, Daniel R., 3,725,194.

Pavement Grooving Ideas, Ltd.: *See*—
Hatcher, Cecil W.; and Warner, Gene, 3,724,900.

Payne, Asa A. Pipe hanger adapter. 3,724,539, Cl. 166-89.000.

Payne, Calvin L., Jr., to Tudor Metal Products Corporation. Parlor-type football board game and associated apparatus. 3,724,852, Cl. 273-94.00r.

Pearson, Frank Arthur, to Gulf & Western Industries, Inc. Relay clutch timer with adjustable cam member. 3,725,616, Cl. 200-38.00r.

Pearson, Michael J.; Olsen, Orrie C.; and Murphy, James F., to Kaiser Aluminum & Chemical Corporation. Catalytic conversion of organic sulfur components of industriil off-gases. 3,725,531, Cl. 423-244.000.

Pech, Josef: *See*—
Jekl, Frantiek; Mateju, Vladimir; Pech, Josef; and Hrdina, Karel, 3,724,508.

Peck, Reese A.: *See*—
Wilson, Raymond F.; Peck, Reese A.; Carter, Norman D.; Cole, Edward L.; and Hess, Howard V., 3,725,250.

Pedain, Josef: *See*—
Erdmenger, Rudolf; Ullrich, Martin; Germerdonk, Rolf; Pedain, Josef; Quiring, Bernd; and Wingler, Frank, 3,725,340.

Pederson, Carl A.: *See*—
McDermott, Michael S.; and Pederson, Carl A., 3,725,729.

Pekarek, G. E.: *See*—
Bowell, S. T.; Ashcroft, Robert; and Pekarek, G. E., 3,725,328.

Pelly, Brian R., to Westinghouse Electric Corporation. Current fed inverter circuit using the time sharing principle. 3,725,768, Cl. 321-6.000.

Pelofsky, Arnold H., to Cities Service Oil Company. Rubber reclamation using ultrasonic energy. 3,725,314, Cl. 260-2.300.

Pelte, Charles: *See*—
Barrot, Jean-Pierre; Negrou, Jacques; and Pelte, Charles, 3,725,785.

Pelz, Karel: *See*—
Protiva, Miroslav; Pelz, Karel; and Metysova, Jirina, 3,725,409.

Penhasi, Harry A., to Beckman Instruments, Inc. Apparatus for automatically performing chemical processes. 3,725,010, Cl. 23-253.00r.

Penn Novelty Co.: *See*—
Mullen, Daniel J., Jr., 3,724,405.

Penno, Edward; Penno, Mary; and Wright, Athol Currie. Composition for waterproofing concrete and aggregate and improving bonding and strength of aggregate. 3,725,088, Cl. 106-12.000.

Penno, Mary: *See*—
Penno, Edward; Penno, Mary; and Wright, Athol Currie, 3,725,088.

Pennsylvania Engineering Corporation: *See*—
Dortenzo, Alexander T., 3,724,827.

Pennwalt Corporation: *See*—
Albert, Harry Elmer, 3,725,363.
D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, 3,725,455.
Sudribin, Leon P.; and Kaiser, Paul, 3,725,225.

Pepe, Charles R. One piece, drive fit, closure cap and sleeve for piles. 3,724,223, Cl. 61-53.000.

Peppler, Richard B.; and Rosskopf, Philip A., Martin-Marietta Corporation. Cement compositions and the preparation thereof. 3,725,097, Cl. 106-90.000.

Percival, Albert: *See*—
Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert, 3,725,554.

Pere, Jean-Francois: *See*—
Bourgoin, Gerard; Kumurdjian, Pierre; Loitiere, Alain; and Pere, Jean-Francois, 3,725,685.

Perfect, Frederick H., to Reading Alloys, Inc. Aluminum-molybdenum-titanium master alloy. 3,725,054, Cl. 75-134.00f.

Perkin-Elmer Corporation, The: *See*—
Marshall, Hamilton W., Jr.; and Smeaton, John R., 3,725,204.

Perkins, Cornelius C.: *See*—
Malmer, Michael M., Jr.; Perkins, Cornelius C.; Waldenmayer, Donald W.; Chowning, Patrick J.; and Gardner, Leonard R., 3,725,868.

Perkins, Earl Stuart; and Hobbs, James, to Butler National Corporation. Apparatus and method of smoothing navigation signals. 3,725,933, Cl. 343-106.00r.

Perkinson, Leon R.: *See*—
Moore, Francis C.; and Perkinson, Leon R., 3,725,003.

Perrine, Walter E. Lifting yoke and harness. 3,724,846, Cl. 272-84.000.

Perry, Glenn R.: *See*—
Brookhyser, Byron B.; Erickson, Harold E.; and Perry, Glenn R., 3,725,183.

Perry, Reginald P.; and Sjoberg, Nils W., to Prime Manufacturing Company. Rib applying machine. 3,724,013, Cl. 12-20.000.

Persson, Henry. Apparatus for deburring a metal strip. 3,724,304, Cl. 83-3.000.

Petelka, Roland J.: *See*—
Welch, Earl S.; and Petelka, Roland J., 3,724,208.

Petering, Wilbur H.: *See*—
McCracken, William L.; Petering, Wilbur H.; Kircher, Charles E., Jr.; and Pinchak, Paul R., 3,725,486.

Peters, Gavin H.: *See*—
Hilbelink, Ronald D.; and Peters, Gavin H., 3,725,501.

Peters, Joseph C.; and Cerulo, Louis J., to Damon Corporation. Sample conveyor and transport system. 3,724,638, Cl. 198-24.000.

Petersen, Everett J., Jr.: *See*—
Rohrbaugh, Donald G.; and Petersen, Everett J., Jr., 3,724,765.

Petersen, Harro: *See*—
Raff, Paul; Reuther, Wolfgang; and Petersen, Harro, 3,725,544.

Petersen, Harro; Fuchs, Friedrich; and Ruemens, Wilhelm, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Flameproofing agent for textile materials. 3,725,272, Cl. 252-8.100.

Peterson, Donald J., to Procter & Gamble, Company, The. (Phenyl thiomethyl) trialkyltin compounds and phenyl substituted derivatives. 3,725,446, Cl. 260-429.700.

Peterson, Richard H. Rapid responding photoelectric attenuator system. 3,725,664, Cl. 250-205.000.

Peterson, Stanley G., to Minnesota Mining and Manufacturing Company. Inking sleeve. 3,724,047, Cl. 29-129.500.

Petitjean, Guy: *See*—
Lenfant, Rene; and Petitjean, Guy, 3,724,924.

Petrinovic, Marko, to Institute "Rudjer Boskovic". Absorption detector for nuclear magnetic resonance measurements with a frequency control. 3,725,776, Cl. 324-.50r.

Petro, James; and Rively, Clair M., to Westinghouse Electric Corporation. Electric lamp mount having a beaded filament coil. 3,725,720, Cl. 313-344.000.

Petro-Tex Chemical Corporation: *See*—
Barone, Bruno J.; and Brill, William F., 3,725,438.

Petry, Gene A.; and Reagan, Michael H., to United States of America, Air Force. Rapid extraction system. 3,724,788, Cl. 244-137.00r.

Pette, Christiane Wilhelmine: *See*—
Mayr, Anton; Wagener, Kurt; Adolf, Johann Ditrich; Pette, Heinrich; and Petzoldt, Klaus, 3,725,542.

Pette, Heinrich: *See*—
Mayr, Anton; Wagener, Kurt; Adolf, Johann Ditrich; Pette, Heinrich; and Petzoldt, Klaus, 3,725,542.

Pettigrew, Robert, to Lever Brothers Company. Detergent compositions. 3,725,286, Cl. 252-89.000.

Petzoldt, Klaus: *See*—
Mayr, Anton; Wagener, Kurt; Adolf, Johann Ditrich; Pette, Heinrich; and Petzoldt, Klaus, 3,725,542.

Peyer, Siegfried: *See*—
Schwartz, Hermann, 3,725,667.

Pfarrwaller, Erwin, to Sulzer Brothers Limited. Loom having a common frame for the warp and cloth beams. 3,724,513, Cl. 139-1.000.

Pfister, Alain: *See*—
Donche, Alain; Thibault, Claude; Arretz, Emmanuel; and Pfister, Alain, 3,725,394.

Pfizer Inc.: *See*—
Holland, Gerald F., 3,725,417.

Pflaum, Rudolf: *See*—
Staschewski, Alfred; Pflaum, Rudolf; and Martin, Helmut, 3,725,139.

Philco-Ford Corporation: *See—*
Houghton, Norman F., 3,724,989.
Phillips, Earl Gordon, to Bell Telephone Laboratories, Incorporated. Clock synchronization arrangement employing delay devices. 3,725,793, Cl. 328-63.000.
Phillips Petroleum Company: *See—*
Campbell, Robert W., 3,725,358.
Cottle, John E., 3,725,377.
Gaeth, Rudolf H., 3,725,379.
Hsieh, Henry L., 3,725,488.
McCord, Donald M., 3,725,166.
Mueller, Francis X., Jr.; and Brown, James D., 3,725,301.
Parker, Harry W.; and Marx, John W., 3,724,548.
Stine, Roy L., 3,725,493.
Trepka, William J.; and Sonnenfeld, Richard J., 3,725,376.
Walker, John H., 3,725,362.
Phillips, Ralph O., to United States of America, Navy, mesne. Pyrojet cutter for underwater or land use. 3,724,372, Cl. 102-1.000.
Photo Electronics Corporation: *See—*
Dreyfoos, Alex W., Jr., 3,724,954.
Picard, Michel, to Societe Industrielle Honeywell Bull (Societe Anonyme). Process for manufacturing a type-carrying printing belt. 3,724,371, Cl. 101-401.100.
Pickering, Richard W.: *See—*
Buchholz, Donald E.; Bakala, Ronald L.; Miller, Robert E.; and Pickering, Richard W., 3,725,912.
Pierce, Joe T., to Texas Instruments, Incorporated. Method of forming superconductive barrier devices. 3,725,213, Cl. 204-15.000.
Pierce, Louis D., 1/2 to Franklin, Ivey. Billiard training apparatus. 3,724,849, Cl. 273-2.000.
Pieri, Giovanni; Aldo, Novara; Held, Llewellyn John; and Bedetti, Gianfranco, to Montecatini Edison S.p.A. Process for producing pigment quality titanium dioxide. 3,725,526, Cl. 423-613.000.
Pierie, Will R.: *See—*
Raible, Donald A.; and Pierie, Will R., 3,723,996.
Pietrzak, Joe P.: *See—*
Campbell, Lewis B.; and Pietrzak, Joe P., 3,724,804.
Pike, John E.: *See—*
Beal, Philip F., III; and Pike, John E., 3,725,454.
Pilipchuk, Viktor Romanovich: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,725,559.
Piltch, Martin: *See—*
Cassedy, Edward S., Jr.; and Piltch, Martin, 3,725,815.
Pinchak, Paul R.: *See—*
McCracken, William L.; Petering, Wilbur H.; Kircher, Charles E., Jr.; and Pinchak, Paul R., 3,725,486.
Piper, Tracy D. Toe harness. 3,724,458, Cl. 128-171.000.
Piqua Engineering Inc.: *See—*
Scarbrough, John D., 3,724,767.
Pitney Bowes-Alpex, Inc.: *See—*
Felcheck, Marvin; Kirschner, Wallace; Jarosik, Robert J.; and Capes, Charles W., 3,725,870.
Pitney-Bowes Alpex, Inc.: *See—*
Murthy, Nanjundiah Narasimha; Macura, Joseph Steven; Gergely, William, Jr.; and Berg, Allen Charles, 3,724,366.
Pittman, Paul F.: *See—*
Bratkowski, Walter V.; and Pittman, Paul F., 3,725,807.
Pittman, Robert W.: *See—*
Rundell, Herbert A.; and Pittman, Robert W., 3,724,558.
Pitts, Robert William, Jr., to Texaco Inc. Means and method for time-sharing multichannel well logging. 3,725,857, Cl. 340-18.ctm.
Pittsburgh-Des Moines Steel Company: *See—*
Edwards, Norman W.; Derr, Vincent H.; and Mattson, Richard A., 3,724,704.
McKibbin, Dean K., 3,724,705.
Pizmoht, Frank, to Heat Sealing Equipment, Mfg., Co. Wrapping machine. 3,724,167, Cl. 53-390.000.
Plapper, Jurgen: *See—*
Stein, Werner; Plapper, Jurgen; and Willmund, Wolf-Dieter, 3,724,999.
Plastica Sudamericana: *See—*
Levoin, Jacques, 3,724,961.
Plizak, Bruno T., to United States of America, Navy. Evaporative cooling and heat extraction system. 3,725,566, Cl. 174-15.00r.
Plockl, Alfons: *See—*
Schneider, Karl-Heinz; Herker, Dietrich; Madgefrau, Herbert; Plockl, Alfons; and Horrwarth, Ernst, 3,725,620.
Ploetz, Theodor: *See—*
Opderbeck, Fritz; Ploetz, Theodor; and Wistuba, Herbert, 3,725,107.
Pneumatic Scale Corporation: *See—*
Sterling, Walter S., 3,724,656.
Pogson, John T., to Boeing Company, The. Constant velocity uniform flow evaporator header. 3,724,522, Cl. 159-13.00b.
Pohlemann, Heinz: *See—*
Kunde, Joachim; Ramlow, Gerhard; Buechler, Guenter; Pohlemann, Heinz; and Hendus, Hans, 3,725,503.
Poje, Albert J.: *See—*
Newallis, Peter E.; Poje, Albert J.; and Epstein, Peter F., 3,725,030.
Polanek, Edward L.: *See—*
Olliges, William E.; Polanek, Edward L.; and Gurney, Robert, 3,725,759.
Polaroid Corporation: *See—*
Batter, John F., Jr., 3,724,935.
Bloom, Stanley M., 3,724,934.
Pollack, Michael J.; and Weidner, Evert C., to Honeywell Inc. Electric current producing cell. 3,725,133, Cl. 136-114.000.
Pollard, Ernest M., to General Electric Company. Static circuit breaker. 3,725,742, Cl. 317-33.0sc.
Polonsky, Samuel: *See—*
Boyles, Robert L.; and Polonsky, Samuel, 3,725,615.
Boyles, Robert L.; and Polonsky, Samuel, 3,725,617.
Polster, Rudolf: *See—*
Fabian, Wolfgang; Franz, Joachim; and Polster, Rudolf, 3,725,433.
Poncha, Rustom Pestonji; Garofano, Norman Rutledge; and Gancy, Alan Brian, to Allied Chemical Corporation. Sodium carbonate crystallization process with foam prevention. 3,725,014, Cl. 23-300.000.
Poos, George Ireland, to McNeil Laboratories, Inc. 2-Imino-pyrrolidines. 3,725,435, Cl. 260-326.50d.
Pope, Robert C.: *See—*
Bradwell, Cyril; and Pope, Robert C., 3,724,828.
Popp, Franz; and Augustin, Wilfried, to Jurid Werke GmbH. Phenolic resin-isocyanate trimerization product and friction material containing the same. 3,725,334, Cl. 260-38.000.
Porret, Daniel; and Habermeier, Juergen, to Ciba-Geigy AG. Curable composition comprising a di-primary diamine containing hydantoin rings and a polyepoxide compound. 3,725,342, Cl. 260-2.00n.
Possis Corporation: *See—*
Possis, Zinon C., 3,725,708.
Possis, Zinon C., to Possis Corporation. Care for a dynamoelectric machine. 3,725,708, Cl. 310-179.000.
Post, Russell: *See—*
Solin, Edward P.; and Post, Russell, 3,725,638.
Potgieter, Marilyn Jean; and Potgieter, Maurice Stephen, to Wheel Carrier Holdings (Proprietary) Limited. Spare-wheel carriers for vehicles. 3,724,731, Cl. 224-42.230.
Potgieter, Maurice Stephen: *See—*
Potgieter, Marilyn Jean; and Potgieter, Maurice Stephen, 3,724,731.
Potlatch Forests, Inc.: *See—*
Hayes, Leonard L., 3,724,841.
Potoski, John R.; and Freed, Meier E., to American Home Products Corporation. 3-Aminomethyl-3-quinuclidinols. 3,725,410, Cl. 260-268.0bc.
Potter, Fred S., to Da-Lite Screen Company, Inc. Picture screen roller fabric attachment. 3,724,524, Cl. 160-24.000.
Pounds, Derrick P.W.: *See—*
de Montigny, Raimbault M.A.T.; Liebergott, Norman; and Pounds, Derrick P.W., 3,725,193.
Pountney, Clifford Harold; and Miller, Edward Francis, to AMP Domestic Inc., mesne. Rechargeable moving tape cell. 3,725,131, Cl. 136-86.00a.
Povalski, Eugene A.; and Bolgert, Edwin F., to Kohler Co. Pressure compensated mixing valve. 3,724,480, Cl. 137-98.000.
PPG Industries, Inc.: *See—*
Christenson, Roger M.; and Anderson, Carl C., 3,725,115.
Cramer, Deane G., 3,725,028.
Loop, Frederick M., 3,725,234.
Parker, Gordon M.; Wismer, Marco; and Hahn, Ernest A., 3,725,116.
Parris, Joseph N., 3,725,023.
Sperry, Lowell L., 3,725,024.
Prasse, Herbert F.; and Mc Cormick, Harold E., to Ramsey Corporation. Coated ferrous substrate. 3,725,017, Cl. 29-196.600.
Pratt, Albert R., to Raytheon Company. Mechanical pushbutton switch with pointed end coil spring contact. 3,725,625, Cl. 200-159.00r.
Pregont, Jack E.: *See—*
Gerard, William L.; and Pregont, Jack E., 3,724,654.
Preston, Leonard A.; and Shriver, Seymour J., to Unitek Corporation. Mixing syringe. 3,724,077, Cl. 32-60.000.
Pretorious, Victor; and Hahn, Hans Helmut. Detection method and apparatus for chromatography. 3,725,232, Cl. 204-180.00g.
Prevorsek, Dusan Ciril: *See—*
Li, Hsin Lang; Prevorsek, Dusan Ciril; and Rothmayer, Noel York, 3,724,039.
Prewitt, Richard H.; Schmidt, Volker; and Schmidt, Erich A. Scratch strain recorder. 3,725,948, Cl. 346-77.000.
Pribil, Stanislav: *See—*
Serbus, Ctibor; Rezac, Jan; Pribil, Stanislav; Marvan, Petr; Krejdirik, Libor; and Stoy, Artur, 3,725,291.
Price, William E.; and Dullabaun, Paul W., to Owens-Illinois, Inc. Ceramic pipe coupling device. 3,724,811, Cl. 251-148.000.
Prime Manufacturing Company: *See—*
Perry, Reginald P.; and Sjoberg, Nils W., 3,724,013.
Primus Mfg., Inc., mesne: *See—*
Culver, Irven H., 3,724,082.
Pringle, William L., to Pullman Incorporated. Railway car. 3,724,394, Cl. 105-368.00r.
Printer Technology Inc.: *See—*
Kaczeus, Steven L., 3,724,631.
Procter & Gamble Company, The: *See—*
Kooistra, John A., 3,725,547.

Peterson, Donald J., 3,725,446.
Wahl, Errol H., 3,725,540.
Proctor, Denver L.: *See—*
Proctor, Rudy R.; and Proctor, Denver L., 3,724,872.
Proctor, Michael: *See—*
Dixon, Amers Ernest; and Proctor, Michael, 3,724,453.
Proctor, Rudy R.; and Proctor, Denver L., to Jet-X Corporation. Walking toy. 3,724,872, Cl. 280-1.177.
Produits Chemiques Pechiney-Saint-Gobain: *See—*
Kemp, Thomas, 3,725,367.
Produits Chemiques Pechiney-Saint-Gobain, mesne: *See—*
Lefebvre, Gerard, 3,725,335.
Proektno-Konstruktorskoe Bjuro po Proektirovani ju Oborudovania dlya Proizvodstva Plasticheskikh Mass i ulitsa Kalinima: *See—*
Kavepa, Alexandr Alexandrovich; Nitkovskikh, Anatoly Anatolievich; Grigoriev, Vladimir Andreevich; Pashkov, Arkady Borisovich; and Epshtein, Yakov Vulfovich, 3,725,013.
Proeschel, Ernst: *See—*
Kuffner, Karl; and Proeschel, Ernst, 3,725,077.
Protiva, Miroslav; Pelz, Karel; and Metysova, Jirina, to Spofa, United Pharmaceutical Works. 8-Substituted 10-piperazino-10, 11-dihydrodibenzo (b,f) thiepines. 3,725,409, Cl. 260-268.0tr.
Pruvot, Francois C.; and Carre, Jean-Claude, to Regie Nationale des Usines Renault. Transmission mechanisms with hydrostatic coupling. 3,724,618, Cl. 192-.070.
Pugh, Cecil C.; Wark, Emerson L.; and Rumpf, Richard O., to General Motors Corporation. Molded plastic base pan for room air conditioner. 3,724,233, Cl. 62-285.000.
Pullman Incorporated: *See—*
Anderson, Steven A.; Barker, Eugene C.; and Yang, Tung Han, 3,724,681.
Pringle, William L., 3,724,394.
Pullman Transport Leasing Company: *See—*
Adler, Franklin P., 3,724,909.
Pulman, Leonard J.: *See—*
Fekete, Frank; Pulman, Leonard J.; and Thrash, David J., 3,725,172.
Pulp and Paper Research Institute of Canada: *See—*
de Montigny, Raimbault M.A.T.; Liebergott, Norman; and Pounds, Derrick P.W., 3,725,193.
Purt, Gustav A.; and Bosshard, Walter, to Cerberus AG. Automatic fire alarm with at least one measuring chamber. 3,725,011, Cl. 23-254.00e.
Putnam, Allen: *See—*
Putnam, Allen Lewis, 3,724,119.
Putnam, Allen Lewis, 1/3 to Putnam, Allen, 1/3 to Launer, Leland C. and 1/3 to Kerridge, Mark L. Fishing fly with leader attaching prongs. 3,724,119, Cl. 43-42.250.
Putnam, Richard V.: *See—*
Holland, Charles E.; Hinson, Robert E., Jr.; and Putnam, Richard V., 3,724,196.
Putthoff, George F. Fishing lure. 3,724,118, Cl. 43-42.060.
Puyhaubert, Jean: *See—*
Chiron, Bernard; and Puyhaubert, Jean, 3,725,826.
Pyrotector, Incorporated: *See—*
Doherty, William F., 3,725,660.
Solomon, Elias E., 3,725,888.
Quebec North Shore Paper Company: *See—*
Zehavi, Samuel; Boivin, Joseph J. R.; Hamilton, Douglas D.; and Ranzenhofer, Raoul, 3,724,518.
Queuille, Andre; and Larde, Raymond, to Roussel-UCLAF. Treatment of diarrhea using an insoluble homopolymer of vinylpyrrolidone. 3,725,541, Cl. 424-80.000.
Quick, George R.; and Sowter, George R., to Singer Company, The, mesne. Self-timing code keyer. 3,725,906, Cl. 340-365.000.
Quinn, John D.: *See—*
Roetter, Robert P.; Miller, Alfred H.; and Quinn, John D., 3,725,026.
Quinn, Mary E. Compressible stencil with high walls and narrow bridges. 3,724,420, Cl. 118-505.000.
Quiring, Bernd: *See—*
Erdmenger, Rudolf; Ullrich, Martin; Germerdonk, Rolf; Pedain, Josef; Quiring, Bernd; and Wingler, Frank, 3,725,340.
Quirk, Virgil P.; and Titlar, James M., to Stackpole Carbon Company. Flame-sprayed ferrite powder X-ray radiation shield. 3,725,718, Cl. 313-313.000.
Rabinowitz, Robert: *See—*
Panzer, Hans Peter; and Rabinowitz, Robert, 3,725,312.
Radomski, Joseph W.: *See—*
Thompson, Gene C.; Radomski, Joseph W.; and Wilson, David E., 3,724,089.
Radscheit, Kurt: *See—*
Stache, Ulrich; Fritsch, Werner; Haede, Werner; Radscheit, Kurt; and Lindner, Ernst, 3,725,393
Raess, Ulrich; and Jan, Daniel, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for the lapping of two gear wheels. 3,724,042, Cl. 29-90.000.
Raff, Paul; Reuther, Wolfgang; and Petersen, Harro, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Fungicide for protecting wood. 3,725,544, Cl. 424-154.000.
Raible, Donald A.; and Pierie, Will R., to American Hospital Supply Corporation. Cloth covered heart valve with protected cage legs. 3,723,996, Cl. 3-1.000.
Raillard, Charles: *See—*
Metzinger, Adrien Louis; and Raillard, Charles, 3,724,339.
Raion Yushi Kabushiki Kaisha: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,724,726.
Rakshys, Joseph W., Jr.: *See—*
McKinley, Suzanne V.; and Rakshys, Joseph W., Jr., 3,725,365.
Ramachandran, Sundaresan, to Allegheny Ludlum Industries, Inc. Deoxidizing metal. 3,725,041, Cl. 75-60.000.
Ramlow, Gerhard: *See—*
Kunde, Joachim; Ramlow, Gerhard; Buechler, Guenter; Pohlemann, Heinz; and Hendus, Hans, 3,725,503.
Ramsey Corporation: *See—*
Prasse, Herbert F.; and Mc Cormick, Harold E., 3,725,017.
Ramstrom, Lee W.: *See—*
Wickham, John L.; Ramstrom, Lee W.; Wordsworth, Albert G.; and Meloni, Robert A., 3,724,563.
Randich, Erasmus A., to Allegheny Ludlum Industries, Inc. Method and apparatus for serving tubes. 3,724,302, Cl. 82-47.00r.
Randle, Thomas C.: *See—*
McCulloch, Charles R.; Moy, Bertram K.; and Randle, Thomas C., 3,725,154.
Ranzenhofer, Raoul: *See—*
Zehavi, Samuel; Boivin, Joseph J. R.; Hamilton, Douglas D.; and Ranzenhofer, Raoul, 3,724,518.
Rapistan Incorporated: *See—*
De Good, Marnard J., 3,724,642.
Rapparlie, Hans, to Licentia Patent-Verwaltungs-G.m.b.H. Device for forming stacks from a flow of consecutively furnished flat items. 3,724,640, Cl. 198-35.000.
Raquith, Howard R.: *See—*
Battaglini, Domenic; Beach, Richard G.; and Raquith, Howard R., 3,724,275.
Rassbach, Felix; and Buttner, Rolf, to Kalle Aktiengesellschaft. Twistable nozzle device for a sausage filling apparatus. 3,724,030, Cl. 17-41.000.
Ratouis, Roger: *See—*
Boissier, Jacques R.; and Ratouis, Roger, 3,725,415.
Ratzel, Dieter, to Bruker Physik AG. Circuit arrangement for generating a phase-shiftable voltage. 3,725,772, Cl. 323-105.000.
Rawson, Edward B.: *See—*
Oldfield, Homer R., Jr.; Rawson, Edward B.; and Schwarzkopf, Daniel B., 3,725,866.
Raytheon Company: *See—*
Bleiweiss, Mark H., 3,725,897.
Clark, Robert A.; and Helgeson, Peter L., 3,724,440.
Deerfield, Alan J., 3,725,649.
Pratt, Albert R., 3,725,625.
RCA Corporation: *See—*
Barbin, Robert Lloyd, 3,725,831.
Beelitz, Howard Raymond, 3,725,801.
Davis, William John, 3,725,582.
Eaton, Sargent Sheffield, Jr., 3,725,822.
Fadner, Glenn Roland, Jr., 3,725,065.
Nolan, Thomas E., 3,725,817.
Sachtleben, Carl; and Steiner, Erich Hans, 3,724,734.
Sussman, Alan, 3,724,925.
Yongue, James M., 3,725,577.
Reactor Centrum Nederland: *See—*
Boose, Cesar Adrianus; Reidt, Maarten Johan; and Derksen, Evert Hermanus, 3,725,137.
Reading Alloys, Inc.: *See—*
Perfect, Frederick H., 3,725,054.
Reagan, Michael H.: *See—*
Petry, Gene A.; and Reagan, Michael H., 3,724,788.
Reale, Salvatore J., to Foster Wheeler Corporation. Shut-off damper. 3,724,809, Cl. 251-58.000.
Rechberger, Franz F., to Norton Company. Method of packaging grinding wheels. 3,724,160, Cl. 53-26.000.
Reddy, Junuthula N., to Bendix Corporation, The. Circuit for providing multiple level output voltage signal in response to a remotely sensed voltage variation and having automatic level switching feedback. 3,725,678, Cl. 307-264.000.
Reed, Charles J., to Ball Brothers Research Corporation. Electrical component connector assembly. 3,725,744, Cl. 317-101.0cc.
Reed, Geoffrey Ronald, to British Iron and Steel Research Association, The. Apparatus and method for packaging. 3,724,159, Cl. 53-3.000.
Reed, Irving S.: *See—*
Brennan, Lawrence E.; and Reed, Irving S., 3,725,922.
Reed, Richard E., to United States of America, Navy. Retractable electrical connector for missiles. 3,724,322, Cl. 89-1.811.
Reeder, Jack M.: *See—*
Mathews, Harold F.; Reeder, Jack M.; and Ingram, James A., 3,725,603.
Reeg, Cloyd P.: *See—*
Hass, Robert H.; Mickelson, Grant A.; Baral, William J.; Reeg, Cloyd P.; Attane, Edward C., Jr.; and Jones, Darryl L., 3,725,243.
Reeve, William Ernest, to Silent Channel Products Limited. Method for the sealing of roof or other structures. 3,724,155, Cl. 52-741.000.
Reeves, Wilson A.: *See—*
Calamari, Timothy A., Jr.; Schreiber, Sidney P.; Cooper, Albert S., Jr.; and Reeves, Wilson A., 3,724,243.
Lanoux, Sigred B.; Ellzey, Samuel E., Jr.; Drake, George L., Jr.; and Reeves, Wilson A., 3,725,001.
Regan, James L. Tape dispenser. 3,725,182, Cl. 156-527.000.
Regel, Erik: *See—*

Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, 3,725,549.
Regie Nationale des Usines Renault: *See—*
Pruvot, Francois C.; and Carre, Jean-Claude, 3,724,618.
Reidt, Maarten Johan: *See—*
Boose, Cesar Adrianus; Reidt, Maarten Johan; and Derksen, Evert Hermanus, 3,725,137.
Reimers, James L., to FMC Corporation. Universal carrier chain for cookers. 3,724,644, Cl. 198-131.000.
Reinecke, Erich, to Westinghouse Bremsen- und Apparatebau G.m.b.H. Automatic slack adjusting device for a brake lever. 3,724,607, Cl. 188-79.50k.
Reinhard, Hans; Mueller, Alfred; and Dotzauer, Bernhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Pressure-sensitive adhesive coated articles having a polyacrylate adhesive coating. 3,725,122, Cl. 117-122.00p.
Reinhoudt, Jacobus Pieter, to U.S. Philips Corporation. Bearing. 3,724,918, Cl. 308-109.000.
Reininghaus & Co., Firma: *See—*
Eversberg, Gerhard; and Seelbach, Heinz, 3,725,695.
Reisch, John C., to Esso Research and Engineering Company. Method of forming complex cobalt carbonyl compounds. 3,725,534, Cl. 423-417.000.
Remington Arms Company, Inc.: *See—*
Bullis, Douglas E.; and Linde, John P., 3,724,112.
Kordas, Martin W.; May, Robert C.; and Scanlon, John J., 3,724,376.
Reni, Cesare: *See—*
Barilli, Filippo; Lugo, Luigi; Di Fiore, Lucio; and Reni, Cesare, 3,725,255.
Lugo, Luigi; Calcagno, Benedetto; and Reni, Cesare, 3,725,256.
Renndorfer, Alfred: *See—*
Leistner, Rudolf; Roth, Johann; and Renndorfer, Alfred, 3,724,936.
Republic Steel Corporation: *See—*
Roblin, John M.; Cole, Frank J.; and Bourne, James G., 3,725,045.
Research Corporation: *See—*
Chang, Thomas M. S., 3,725,113.
Stoner, Glenn E., 3,725,226.
Retali, Roger; Mercier, Andre; and Billot, Claude, to Fives Lille-Cail. Rotor mounting. 3,724,238, Cl. 64-7.000.
Retali, Roger; Dambrine, Francis; Giorgi, Jean Claude; and Windal, Georges, to Societe Fibes Lille-Cail. Method and system for controlling a crystallization installation. 3,725,127, Cl. 127-16.000.
Reti, Adrian R.: *See—*
Ehrreich, John E.; and Reti, Adrian R., 3,725,036.
Rettew, Richard Raymond: *See—*
Levy, Newton, Jr.; Wirth, David Griffith, Jr.; and Rettew, Richard Raymond, 3,725,094.
Retzky, Clarence M., to Insta-Datic Corporation. Photographic credit card system. 3,725,647, Cl. 235-61.12r.
Reuter, Ernst Gottfried, to Licentia Patent-Verwaltungs-GmbH. Method and circuit arrangement for displaying or recording a sequence of binary bits. 3,725,672, Cl. 307-208.000.
Reuther, Wolfgang: *See—*
Raff, Paul; Reuther, Wolfgang; and Petersen, Harro, 3,725,544.
Revell, Donald H.; and Kittell, Frank J., to Reynolds Metals Company. Extrusion apparatus and method. 3,724,253, Cl. 72-253.000.
Rewop Company: *See—*
Caldwell, Alan K., 3,724,583.
Rexford, Donald L., to General Electric Company. Laminar rate sensor. 3,724,477, Cl. 137-838.000.
Reynolds, Jefferson W.; and Sloan, Cephas H., to Eastman Kodak Company. Tobacco smoke filter. 3,724,469, Cl. 131-266.000.
Reynolds Metals Company: *See—*
Revell, Donald H.; and Kittell, Frank J., 3,724,253.
Rezac, Jan: *See—*
Serbus, Ctibor; Rezac, Jan; Pribil, Stanislav; Marvan, Petr; Krejdirik, Libor; and Stoy, Artur, 3,725,291.
Reznitsky, Alexandr Mikhailovich: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,725,559.
Rheinmetall G.m.b.H.: *See—*
Zielinski, Erich, 3,724,324.
Rhodes, Alex: *See—*
Kitzner, Ernest W.; Rhodes, Alex; and Rose, James, 3,724,286.
Rhodes, Keith H., to Case, J. I., Company. Power-take off clutch. 3,724,627, Cl. 192-110.00b.
Rhone-Poulenc S.A.: *See—*
Bargain, Michel, 3,725,345.
Richard, Joseph D. Delayed release device. 3,724,120, Cl. 43-100.000.
Richards, Powell: *See—*
Eckelman, William C.; and Richards, Powell, 3,725,295.
Richards, Raymond S.; and St. John, Douglas F. Swimming pool heater. 3,724,446, Cl. 126-350.00r.
Richardson, Donald C., to Warren Fastener Corporation. Damper assembly. 3,724,812, Cl. 251-306.000.
Richardson, Murl R., to Oil States Rubber Company. Expanded-ring swab cup cage. 3,724,337, Cl. 92-241.000.
Richardson, Murl R., to Oil States Rubber Company. Swab cup cage. 3,724,338, Cl. 92-241.000.
Richie, Edward H.: *See—*
Jones, Kenneth W.; and Richie, Edward H., 3,724,114.
Rickert, Royce J.: *See—*
Notari, Gennaro V.; and Rickert, Royce J., 3,725,199.
Ricoh Co., Ltd.: *See—*
Kanno, Tadaaki; and Iwamoto, Minoru, 3,724,949.
Koizumi, Yutaka, 3,724,940.
Suzuki, Minoru, 3,724,839.
Ridder, Georg Sven-Olof; and Lorinder, Hans Goran. Vehicle, especially a station wagon, having a vortex generator for producing an attached flow over the rear window. 3,724,892, Cl. 296-1.00s.
Ridyard, Annesley: *See—*
Austin, Peter William; Crabtree, Allen; Leng, John Lindley; Robert, Denis; Ridyard, Annesley; and Young, Elliott, 3,725,383.
Riedel, John Y., to Bethlehem Steel Corporation. Cold work die steel. 3,725,050, Cl. 75-126.000.
Riester, James J.: *See—*
Calkins, Burton H.; Carstens, Dale L.; and Riester, James J., 3,724,375.
Rigert, Max, to McGraw-Edison Company. Control means for reclosing circuit breaker. 3,725,830, Cl. 335-32.000.
Rigips-Stempel GmbH. & Co., KG: *See—*
Streck, Friedrich, 3,724,825.
Riker Laboratories, Inc., mesne: *See—*
Trancik, Ronald J.; Scherrer, Robert A.; and Harrington, Joseph Kenneth, 3,725,451.
Rinaldo, Michael S., to Stamets, Wm. K., Company. Chamfering apparatus for tubular articles. 3,724,303, Cl. 82-59.000.
Rindner, Wilhelm: *See—*
Hopkins, John B.; and Rindner, Wilhelm, 3,725,835.
Ringwall, Carl Gustav: *See—*
Haefner, Kenneth Browning; and Ringwall, Carl Gustav, 3,724,478.
Ripley, Dennis L. Two-stage dehydrogenation process for producing diolefins. 3,725,494, Cl. 260-680.00e.
Ritter, Josef; and Gott, Hans, to EVG Entwicklungs- und Verwertungsgesellschaft m.b.H. Multiple spot welding machines. 3,725,632, Cl. 219-116.000.
Rittler, Hermann L.: *See—*
Chyung, Chi-Kwun; and Rittler, Hermann L., 3,725,091.
Rival Manufacturing Company: *See—*
McLean, Robert E., 3,724,069.
Rively, Clair M.: *See—*
Petro, James; and Rively, Clair M., 3,725,720.
Rivenes, Arnold S. Retarded glide bomb. 3,724,373, Cl. 102-4.000.
Robert, Andre: *See—*
Smith, Leon; Calvert, David W.; Robert, Andre; Viallet, Andre; and Pauw, Daniel R., 3,725,194.
Robert, Denis: *See—*
Austin, Peter William; Crabtree, Allen; Leng, John Lindley; Robert, Denis; Ridyard, Annesley; and Young, Elliott, 3,725,383.
Roberts, David C., to International Business Machines Corporation. Line finding system and method for character recognition. 3,725,862, Cl. 340-146.30h.
Roberts, Edward S., to Treadwell Corporation. Kiln seal. 3,724,887, Cl. 263-33.00r.
Roberts, Preston C., to Kajan Specialty Company, Inc. Well impact tools. 3,724,576, Cl. 175-293.000.
Roberts, Rene Marie-Joseph: *See—*
Koleske, Joseph Victor; Roberts, Rene Marie-Joseph; and Del Giudice, Frank Paul, 3,725,352.
Roberts, William L.: *See—*
Patula, Edward J.; Roberts, William L.; and Somers, Robert R., 3,725,140.
Robinson, Alexander: *See—*
Beaulieu, Alexandre J.; Fortin, Roger; Johnson, Derwyn C.; and Robinson, Alexander, 3,725,735.
Robinson, Daniel E.; and Rubinstein, Solomon, to General Cable Corporation. Wall receptacle with improved connector terminal construction. 3,725,841, Cl. 339-14.00r.
Robinson, John W.; and Whittington, Billy Joe, to Jasper Electronics Manufacturing Corporation, The. Chord playing organ. 3,725,560, Cl. 84-1.010.
Robinson, Joseph D.; and Vogiatzis, John P., to Shell Oil Company. Method for determining distance and direction to a cased borehole using measurements made in an adjacent borehold. 3,725,777, Cl. 324-8.000.
Robinson, Robert E., to National Distillers and Chemical Corporation. Process for aromatic substitution. 3,725,463, Cl. 260-479.00r.
Roblin, John M.; Cole, Frank J.; and Bourne, James G., to Republic Steel Corporation. Apparatus and method for vaporizing molten metal. 3,725,045, Cl. 75-93.000.
Robroy Industries: *See—*
Slocum, Fred H., 3,724,706.
Rochester Telephone Corporation, The: *See—*
Allen, Richard W.; Maring, Donald G., Sr.; and Andrews, Henry J., Jr., 3,725,613.
Rockford Servo Corporation: *See—*
Bonner, William A., 3,724,732.
Rode, D. John, to Sinclair-Koppers Company, mesne. Fluid distributor for use in extruding foamed polymeric materials. 3,724,976, Cl. 425-72.000.
Rodemann, Alfred N.: *See—*
Mohon, Windell N.; and Rodemann, Alfred N., 3,724,933.

Roder, Manfred, to Arbeitsstelle fur Molekularelektronik. Fabrication of integrated microcircuits utilizing dielectric-p-n junction isolation. 3,725,146, Cl. 148-175.000.

Rodgers, John T.; Williams, Richard M.; and Larsen, Richard J., to Ducommun Incorporated, mesne. Process of coating articles with pyrolytic graphite and coated articles made in accordance with the process. 3,725,110, Cl. 117-46.0cg.

Rodi, Fritz; and Hund, Franz, to Farbenfabriken Bayer Aktiengesellschaft. Ferromagnetic chromium dioxide. 3,725,281, Cl. 252-62.510.

Roehl, Ernest R.; and Carey, Gerald D., to United States of America, Air Force. Microwave sensitivity time control circuit. 3,725,913, Cl. 343-5.0sm.

Roetter, Robert P.; Miller, Alfred H.; and Quinn, John D., to Libbey-Owens-Ford Company. Apparatus for producing all-glass multiple sheet glazing units. 3,725,026, Cl. 65-156.000.

Rogalski, Werner; Jonas, Rochus; Wahlig, Helmut; and Bergmann, Rolf, to Merck Patent Gesellschaft mit beschrankter Haftung. 6-Aminopenicillanic acid derivatives and proces for the preparation thereof. 3,725,390, Cl. 260-239.100.

Roger, Albert J. Valve clamp for elastically deformable tubes. 3,724,818, Cl. 251-9.000.

Rogers Brothers Company: *See*—
Miller, Paul G.; Hsinchu, Taiwan; and Griffith, Francis C., 3,725,087.

Rogers, Jae P. Transposing piano with laterally movable keyboard. 3,724,317, Cl. 84-447.000.

Rogers, Morris Gwynne; and Tsai, James Hwa-San, to Dow Chemical Company, The. Process for the preparation of high molecular weight polyepoxides from polyepoxides and polyhydroxyl-containing compounds. 3,725,341, Cl. 260-47.0ep.

Rogers, Richard E.: *See*—
Brownell, Roy D.; and Rogers, Richard E., 3,724,679.

Rogier, Edgar R.: *See*—
Coury, Arthur J.; and Rogier, Edgar R., 3,725,450.

Rohde, Wilhelm; and Helfgen, Werner, to Dynamit Nobel Aktiengesellschaft. Process for the production of a fuse having a hollow channel. 3,724,318, Cl. 86-1.000.

Rohm & Haas G.m.b.H.: *See*—
Bauer, Peter, 3,725,315.

Rohr, Harry: *See*—
Wirth, Wolf-Dieter; Muller, Erwin; Blahak, Johannes; and Rohr, Harry, 3,725,321.

Rohr Industries, Inc.: *See*—
Ellis, Peter H., 3,724,759.
Kendall, Earl W., 3,725,224.

Rohrbaugh, Donald G.; and Petersen, Everett J., Jr., to Beckman Instruments, Inc. Tablet disruptor device. 3,724,765, Cl. 241-46.060.

Rohrlack, Friedrich K. W.: *See*—
Le Blanc, Walter J.; and Rohrlack, Friedrich K. W., 3,724,624.

Rohrlack, Friedrich K. W.; and Main, Ralph R., to Goodrich, B. F., Company, The. Segmented friction for brake or clutch. 3,724,625, Cl. 192-107.00r.

Roider, Richard Harden, to Lundquist Tool and Manufacturing Co., The. Driven member locking device. 3,724,884, Cl. 287-52.080.

Roizin, Natan Moiseevich; Larionav, Igor Naumovich; and Kolesova, Alvina Grigorievna. Method of alloying a monocrystal of a semiconductor. 3,725,147, Cl. 148-183.000.

Roll, Henry E.: *See*—
Mills, Harry N.; and Roll, Henry E., 3,725,022.

Rollei-Werke Franke & Heidecke: *See*—
Schneider, Arthur, 3,725,734.

Roller-Werke Franke & Heidecke: *See*—
Mielke, Bodo, 3,724,350.

Rollings, William A.: *See*—
Armstrong, Luther W.; and Rollings, William A., 3,724,199.

Rollins, Lester G. Cutter chain having increased conveying ability. 3,724,901, Cl. 299-84.000.

Romberg, Felix B. Vehicle actuated automatic gate. 3,724,132, Cl. 49-364.000.

Ronden, Clifford P.; and Roylance, Donald C., to Cupples Container Co. Nucleation of thermoplastic polymeric foams. 3,725,317, Cl. 260-2.50e.

Roper Corporation: *See*—
Holtzman, Samuel J.; and Cosme, Peter A., 3,724,057.

Rosa, Faust. Centrifugal distillation system. 3,725,209, Cl. 203-24.000.

Rosaen, Nils O. Fluid device having flow control and indicating means. 3,724,269, Cl. 73-207.000.

Rosborough, Robert S., Jr.; and Wright, Luther M., to Eastman Kodak Company. Method of splicing the two ends of film strips. 3,725,168, Cl. 156-157.000.

Rose, Harold Bern; and Sand, Bruce Jay, to Bio-Optronics, Inc. Electrical digital display tonometer. 3,724,263, Cl. 73-80.000.

Rose, James: *See*—
Kitzner, Ernest W.; Rhodes, Alex; and Rose, James, 3,724,286.

Rose, Selwyn H.: *See*—
Wainer, Eugene; Rose, Selwyn H.; and Harkulich, Theodore M., 3,724,066.

Rosemount Engineering Company Limited: *See*—
Fullager, Harry, 3,725,837.

Rosenbaum, Erik: *See*—
Klimchak, Edward George; and Rosenbaum, Erik, 3,725,928.

Rosenberg, Harold: *See*—
Bilow, Norman; and Rosenberg, Harold, 3,725,175.

Rosenwach, Wallace. Horizontally oriented planter. 3,724,127, Cl. 47-34.000.

Ross, Melvin Andrew. Speed control apparatus for hot gas engine. 3,724,206, Cl. 60-24.000.

Rossigno, Louis P., to Bendix Corporation, The. Cam operated control. 3,724,910, Cl. 303-12.000.

Rosskopf, Philip A.: *See*—
Peppler, Richard B.; and Rosskopf, Philip A., 3,725,097.

Roth, Carl W., to Vapor Corporation. Door system for high-low platforms. 3,724,396, Cl. 105-378.000.

Roth, Johann: *See*—
Leistner, Rudolf; Roth, Johann; and Renndorfer, Alfred, 3,724,936.

Rothmayer, Noel York: *See*—
Li, Hsin Lang; Prevorsek, Dusan Ciril; and Rothmayer, Noel York, 3,724,039.

Rothrock, James S.: *See*—
Cain, Robert L.; and Rothrock, James S., 3,724,816.

Roup, Rolland R.: *See*—
Schor, Ferdinand William; and Roup, Rolland R., 3,724,834.

Roussel, Jean, to Societe Anonyme: dite THIMONNIER & Cie. Machine for packing fluid products in bags. 3,724,163, Cl. 53-171.000.

Roussel-UCLAF: *See*—
Queuille, Andre; and Larde, Raymond, 3,725,541.

Rousselet, Joseph Antoine Noel. Continuous production centrifuge. 3,724,091, Cl. 34-58.000.

Roylance, Donald C.: *See*—
Ronden, Clifford P.; and Roylance, Donald C., 3,725,317.

Rubery, Owen & Co., Limited: *See*—
Brickley, Terence, 3,724,891.
Hawkins, John Charles; and Waite, William, 3,724,796.

Rubin, David; and Seybold, John B., to United States of America, Navy. One shot multivibrator for variable width video edge detector. 3,725,682, Cl. 307-273.000.

Rubin, Irving N.; and Jimenez, Ivan. Telescopic sight mounting. 3,724,800, Cl. 248-205.00r.

Rubinstein, Solomon: *See*—
Robinson, Daniel E.; and Rubinstein, Solomon, 3,725,841.

Ruburn Engineering, Inc.: *See*—
Brevko, Robert; Bitsura, Michael P.; Mucka, John R.; and Zinski, Peter, 3,724,164.

Ruby, Burton B., to Jaymar-Ruby, Inc. Trousers waistband structure. 3,723,993, Cl. 2-237.000.

Ruegg, Erwin A., to Stoffel Seals Corporation. Plastic tag-fastening element. 3,724,109, Cl. 40-22.000.

Ruemens, Wilhelm: *See*—
Petersen, Harro; Fuchs, Friedrich; and Ruemens, Wilhelm, 3,725,272.

Rumanowski, Edmund J., to Allied Chemical Corporation. Benzyl-N-(N-butyl) chlorophenoxythiobutyrimidates. 3,725,452, Cl. 260-453.00r.

Rumpf, Richard O.: *See*—
Pugh, Cecil C.; Wark, Emerson L.; and Rumpf, Richard O., 3,724,233.

Rundell, Herbert A.; and Pittman, Robert W., to Texaco Inc. Apparatus for controlling the rotary speed of a drill. 3,724,558, Cl. 173-1.000.

Ruof, Edgar J., to Goodyear Tire & Rubber Company, The. Skid detector circuit. 3,724,902, Cl. 303-21.0cg.

Rupert, Paul D.; and Rupert, Raymond D. Fire fighting system. 3,724,554, Cl. 169-2.00a.

Rupert, Raymond D.: *See*—
Rupert, Paul D.; and Rupert, Raymond D., 3,724,554.

Ruppel, James Harold, to Esso Production Research Company. Subsurface safety valve. 3,724,475, Cl. 137-67.000.

Russell, Allen S.; Knapp, Lester L.; and Haupin, Warren E., to Aluminum Company of America. Production of aluminum. 3,725,222, Cl. 204-67.000.

Russell, James G.: *See*—
Harstead, Gunnar A.; Locante, John; and Russell, James G., 3,725,198.

Russell, Ronald W.: *See*—
Frederiksen, Thomas M.; and Russell, Ronald W., 3,725,673.

Rust, John B.: *See*—
Keister, Frank Z.; and Rust, John B., 3,725,671.

Ruzzo, Joseph G., Jr., to United States of America, Air Force. Method for preparing pasted nickel hydroxide electrode. 3,725,129, Cl. 136-29.000.

Ryabinin, Vladimir Alexandrovich: *See*—
Leliovsky, Anton Felixovich; Ryabinin, Vladimir Alexandrovich; Terra, Karl Romanovich; and Yankevich, Kira Boleslavovna, 3,725,717.

Rydeski, Roman R.; and Conway, Richard F. Method of preparing puffable food pellets from pork skins. 3,725,084, Cl. 99-107.000.

Rynbrandt, Ronald H., to Upjohn Company, The. Exo-bicycloalkane carboxamides. 3,725,423, Cl. 260-295.00k.

Ryon, David M., to General Electric Company. Textured membranes for blood dialyzers, oxygenators and the like. 3,724,673, Cl. 210-500.000.

Sabad, Joseph J.: *See*—
Denk, Hans H.; and Sabad, Joseph J., 3,725,285.

Saccomano, Joseph M.; and Ellis, John D., Jr., to Joslyn Mfg. and Supply Co. Molten metal reactor vessel. 3,724,830, Cl. 266-36.00p.

Sachs, Harald, to Siemens Aktiengesellschaft. Arrangement for the detection of faults in electronic circuits. 3,725,880, Cl. 340-173.0rc.

Sachtleben, Carl; and Steiner, Erich Hans, to RCA Corporation. Web transport. 3,724,734, Cl. 226-57.000.

Sadamori, Toshimasa: *See—*
Ukita, Keizo; and Sadamori, Toshimasa, 3,725,492.

Sadler, Porter, to Texas Instruments, Incorporated. Image pick-up tube support structure for semiconductive target. 3,725,711, Cl. 313-66.000.

Saeki, Kenji: *See—*
Arakawa, Takaai; Saeki, Kenji; Sato, Yoshikuni; and Kitazawa, Yoriya, 3,725,497.

Saffer, Alfred: *See—*
Brown, David; and Saffer, Alfred, 3,725,307.

Saint Clair, John Q., II: *See—*
Martin, Wilhiam A.; and Saint Clair, John Q., II, 3,724,777.

Saint-Gobain: *See—*
Gimenez, German Artigas, 3,725,025.

Saito, Jiro: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Hirakawa, Michio, 3,725,336.

Sakai, Yoshinori; and Hori, Takashi, to Maruzen Oil Company, Limited. Process for preparation of over-based sulfurized phenates. 3,725,381, Cl. 260-137.000.

Sakakibara, Kozo: *See—*
Kawano, Akira; Sakakibara, Kozo; Abe, Iwao; and Chonan, Takayuki, 3,725,472.

Sakamoto, Kenji: *See—*
Maezawa, Shiro; Yoshikawa, Hiroshi; Sakamoto, Kenji; Fujii, Jun; and Hashimoto, Makoto, 3,725,208.

Sakunaga, Kenichi: *See—*
Chimura, Kazuya; Kaneko, Takashi; Nakazono, Ryuichi; Mukai, Takuma; Nakazima, Atushi; and Sakunaga, Kenichi, 3,724,038.

Salmond, Kent A.: *See—*
Clark, William A., IV; Salmond, Kent A.; and Stafford, Thomas S., 3,725,864.

Salomonsson, Sven-Olof: *See—*
Eng, Kjell; and Salomonsson, Sven-Olof, 3,724,284.

Saltzstein, Julian I., to Sure Lock Systems, Inc. Vehicle security system. 3,725,939, Cl. 343-225.000.

Samson, Marvin S.: *See—*
Gery, Herbert C.; and Samson, Marvin S., 3,724,369.

Sand, Bruce Jay: *See—*
Rose, Harold Bern; and Sand, Bruce Jay, 3,724,263.

Sanders Associates, Inc.: *See—*
Cutler, Thomas P., 3,725,916.
Hayner, Paul F.; and Brockway, Richard J., 3,724,502.
Wachtel, Alan, 3,725,573.

Sanders Nuclear Corporation: *See—*
Mayo, Kenneth E.; and Fretague, William J., 3,725,663.

Sanderson, Paul E. Aquatic device. 3,724,012, Cl. 9-311.000.

Sandoz Ltd.: *See—*
Grandjean, Philippe, 3,725,382.

Sandoz-Wander, Inc.: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,725,412.

Saner, Kaspar, to Wirth, Gallo & Co. Electronic measuring apparatus for measuring masses and forces. 3,724,572, Cl. 177-210.000.

Saner, Kaspar, to Wirth, Gallo & Co. Electronic measuring apparatus for measuring masses and forces. 3,724,573, Cl. 177-210.000.

Sanford, David A.: *See—*
Mattice, William G.; and Sanford, David A., 3,725,262.

Sanford, Peter E.: *See—*
Ellerton, Norman V.; Paradise, William F.; and Sanford, Peter E., 3,725,399.

Sankyo Chemical Industries Limited: *See—*
Nagoya, Tsutomu; Fujima, Yoshito; and Shimizu, Yoichi, 3,725,437.

Sanner, Richard D., to Owens-Illinois, Inc. High lead content glass composition for television neck tubes. 3,725,093, Cl. 106-53.000.

Santeler, Donald J., to Aero Vac Corporated, mesne. Delta T bar spectrometer. 3,724,169, Cl. 55-20.000.

Santilli, Arthur A.; and Kim, Dong H., to American Home Products Corporation. 2,4,7-Trisubstituted-[pyrido 2,3-d] pyrimidine-6-carboxamides. 3,725,405, Cl. 260-247.20a.

Santo, Don. Portable massaging device. 3,724,451, Cl. 128-52.000.

Sanyo Pulp Kabushiki Kaisha: *See—*
Suzuki, Shigemasa; and Nakamura, Kozo, 3,725,520.

Sanza, Frank J.: *See—*
Cassano, James R.; and Sanza, Frank J., 3,724,939.

Sapir, Said, to International Telephone and Telegraph Corporation. System for heating or air conditioning. 3,724,535, Cl. 165-26.000.

Sargent, Freeman E. Endless track vehicles. 3,724,397, Cl. 180-9.540.

Sarver, James F., Jr.: *See—*
Hummel, Floyd A.; and Sarver, James F., Jr., 3,725,102.

Sasaki, Nobuharu: *See—*
Yamamoto, Kenji; Sasaki, Nobuharu; and Terayama, Mutsuo, 3,725,416.

Sastri, Aiyaswami S.: *See—*
Fischbein, Irwin W.; Alexander, Ben H.; and Sastri, Aiyaswami S., 3,725,238.

Sato, Norio: *See—*
Yasudi, Susumu; and Sato, Norio, 3,725,813.

Sato, Shiro: *See—*
Yamamura, Toshio; Omote, Yuichi; Sato, Shiro; and Kani, Hiyama, 3,725,527.

Sato, Yoshikuni: *See—*
Arakawa, Takaai; Saeki, Kenji; Sato, Yoshikuni; and Kitazawa, Yoriya, 3,725,497.

Satoh, Susumu; Tanaka, Hideki; Ono, Shujiro; and Horiguchi, Hiroshi, to Nippon Steel Corporation. Semi-killed high tensile strength steels. 3,725,049, Cl. 75-123.00d.

Satoru, Honjo: *See—*
Masaaki, Taimoto; and Satoru, Honjo, 3,725,060.

Saubestre, Edward B.; and Durney, Lawrence J., to Enthone, Incorporated. Chemical reduction metal plated diallylphthalate polymer and preparation process. 3,725,108, Cl. 117-47.00a.

Sauder, Kenneth D. Rotary internal combustion engine. 3,724,427, Cl. 123-8.070.

Sauter Packaging Company: *See—*
Nichols, Matthew, 3,724,165.
Nichols, Matthew, 3,724,308.

Savage, Billy J.: *See—*
Harris, Garrett H.; Dutt, Edward A.; and Savage, Billy J., 3,724,790.

Sawada, Seizo: *See—*
Shirato, Akira; Nishizawa, Hitoshi; and Sawada, Seizo, 3,725,330.

Sawagata, Shinichi, to Tokyo Shibaaura Electric Co., Ltd. Triple electron gun assembly having units attached by glass beads to protrusion from convergence electrode. 3,725,712, Cl. 313-70.00c.

Sawaya, Shohachi: *See—*
Masumoto, Hakaru; Sawaya, Shohachi; and Kikuchi, Michio, 3,725,052.
Masumoto, Hakaru; Sawaya, Shohachi; and Michio, Kikuchi, 3,725,053.

Scanlon, John J.: *See—*
Kordas, Martin W.; May, Robert C.; and Scanlon, John J., 3,724,376.

Scanlon, Patricia M.; and Young, Elwyn R., to Grace, W. R., & Co. Process for preparing amidine salts. 3,725,456, Cl. 260-465.00d.

Scarbrough, John D., to Piqua Engineering Inc. Shredder-grinder machine having an improved rotor. 3,724,767, Cl. 241-186.00r.

Scarsella, Edward L.: *See—*
Stefanucci, Arthur; Harnisch, Douglas R.; Coogan, Joseph E., III; and Scarsella, Edward L., 3,725,076.

Schaefer, John O.: *See—*
Korb, Frank J.; and Schaefer, John O., 3,724,633.

Schaefer, Werner, to Hartmann & Braun Aktiengesellschaft. Infrared gas analyser. 3,725,702, Cl. 250-43.50r.

Schaeffer, Dennis R.; and Wright, Larry R., to Motorola, Inc. Impulse noise blanker including broadband level sensing. 3,725,674, Cl. 307-237.000.

Schafer, Leonhard. Pastry making machine. 3,724,361, Cl. 99-450.600.

Schaffer, Robert H.; and Crum, James N., to Harris-Intertype Corporation. Web infeed mechanism. 3,724,733, Cl. 226-25.000.

Schaller, Robert L., to Sundstrand-Engelberg, Inc. Bar feeder apparatus. 3,724,648, Cl. 198-211.000.

Schaumburg, Gunter, to Societe d'Exploitation des Brevets Neiman S.A. Lock actuated anti-theft device mainly for automobiles. 3,724,244, Cl. 70-360.000.

Scheer, Erich: *See—*
Voland, Dieter; and Scheer, Erich, 3,725,618.

Scheffler, David R.: *See—*
Burrough, Donald E.; Scheffler, David R.; and Seefeld, Dean E., 3,724,908.

Scheiber, Robert: *See—*
Von Belvard, Peter Revy; and Scheiber, Robert, 3,724,349.

Scheinpflug, Hans: *See—*
Buchel, Karl-Heinz; Regel, Erik; Grewe, Ferdinand; Scheinpflug, Hans; and Kaspers, Helmut, 3,725,549.

Schell, Allan C.: *See—*
Sletten, Carlyle J.; Schell, Allan C.; Mack, Richard B.; Goggins, William B., Jr.; and Blacksmith, Philipp, 3,725,917.

Schenck, Hermann: *See—*
Wenzel, Werner; Schenck, Hermann; and Gudenau, Heinrich-Wilhelm, 3,725,038.

Schenk, Erwin: *See—*
Kemper, Jurgen; and Schenk, Erwin, 3,725,860.

Schenk, Erwin; and Biedermann, Kurt, to Siemens Aktiengesellschaft. Process for the measurement of the distortion in transmission systems which transmit data in parallel bit coded form. 3,725,796, Cl. 328-163.000.

Scherrer, Robert A.: *See—*
Trancik, Ronald J.; Scherrer, Robert A.; and Harrington, Joseph Kenneth, 3,725,451.

Schick Electric Inc.: *See—*
Bostick, Frank W., 3,725,190.

Schiemann, Wolfram. Apparatus for making a container of plastic material. 3,724,981, Cl. 425-109.000.

Schiemann, Wolfram. Apparatus for the blowing of a two-compartment can. 3,724,987, Cl. 425-326.000.

Schimmelschmidtq Kurt; and Kleiner, Hans-Jerg, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the preparation of dialkyl phosphites from ahcohols and phosphorous acid. 3,725,515, Cl. 260-978.000.

Schindler, Walter; Schmid, Erich; and Zuest, Armin, to Ciba-Geigy Corporation. [4-(10,11-Dihydrodibenz[b,f] oxepin-10-yl)-1-piperazinyl-alkyl]r3-alkyl-2-imidazolidinones as CNS-depressants. 3,725,411, Cl. 260-268.0tr.
Schipper, Dirk A. Method and apparatus for pipeline connection. 3,724,061, Cl. 29-464.000.
Schlossberg, Howard, to United States of America, Air Force. Apparatus for locking the frequency of a laser to an atomic absorption line. 3,725,814, Cl. 331-94.500.
Schlosser, Klaus: *See—*
Olsen, Willi; and Schlosser, Klaus, 3,725,567.
Schlumberger Technology Corporation: *See—*
Chapman, Joseph E., III, 3,724,589.
Kisling, James W., III, 3,724,493.
Lanmon, C. P., II, 3,724,550.
Urbanosky, Harold J.; and Whitten, Frank R., 3,724,540.
Schmick, Russell M.; and Jocyno, Henry, to Badger Meter, Inc. Electromagnetic register apparatus. 3,725,648, Cl. 235-92.00c.
Schmid, Erich: *See—*
Schindler, Walter; Schmid, Erich; and Zuest, Armin, 3,725,411.
Schmidt, Donald L., to United States of America, Air Force. Ablative nose tips and method for their manufacture. 3,724,386, Cl. 102-105.000.
Schmidt, Erich A.: *See—*
Prewitt, Richard H.; Schmidt, Volker; and Schmidt, Erich A., 3,725,948.
Schmidt, Fritz, to Siemens Aktiengesellschaft. Expansion member for superconducting cable. 3,725,565, Cl. 174-13.000.
Schmidt, Volker: *See—*
Prewitt, Richard H.; Schmidt, Volker; and Schmidt, Erich A., 3,725,948.
Schmidt, Wilfred: *See—*
Kleiber, Armin; and Schmidt, Wilfred, 3,724,805.
Schmitt, Karl: *See—*
Kuch, Heinz; Schmitt, Karl; Seidl, Gunther; and Hoffmann, Irmgard, 3,725,404.
Schmitz, William L., to Vac-O-Cast. Dental cement gun. 3,724,076, Cl. 32-60.000.
Schmoyer, Arthur R. Programmed audio-visual presentation of information for instruction in the operating of keyboard controlled instruments. 3,724,097, Cl. 35-6.000.
Schmucker, Arden Everett: *See—*
Fabris, Hubert Jakob; Maxey, Edwin Morgan; and Schmucker, Arden Everett, 3,725,357.
Schneck, Erich: *See—*
Voigt, Hartman; Schneck, Erich; Gunther, Klaus; and Noha, Klaus, 3,725,491.
Schneck, Waldemar; and Huttenlocher, Dieter, to Huttenlocher, Walter. Apparatus for flocking cylindrical bodies. 3,724,421, Cl. 118-630.000.
Schneider, Alan A.: *See—*
Moser, James R.; and Schneider, Alan A., 3,725,132.
Schneider, Arthur, to Rollei-Werke Franke & Heidecke. Electronic flash device. 3,725,734, Cl. 315-241.00p.
Schneider, Karl-Heinz; Herker, Dietrich; Madgefrau, Herbert; Plockl, Alfons; and Horrwarth, Ernst, to Bosch, Robert, G.m.b.H. Distributor plate structure and fixedly mounting attachment mean to distributor housing. 3,725,620, Cl. 200-19.00r.
Schneider, Michael, to Girdler-Sudchemie Katalysator G.m.b.H. Recovery of noble metals. 3,725,047, Cl. 75-108.000.
Schneider, Othmar: *See—*
Knapp, Walter; and Schneider, Othmar, 3,724,946.
Schnoring, Hildegard: *See—*
Naumann, Gunter; Schon, Nikolaus; Schnoring, Hildegard; and Pampus, Gottfried, 3,725,313.
Schnormeier, Theodore H., to Wenco, Inc. Tilt-take-out window assembly. 3,724,131, Cl. 49-181.000.
Schoeller & Co.: *See—*
Seibelq Georg, 3,725,909.
Scholl, Albert S. Cutting tool. 3,724,010, Cl. 7-14.10a.
Scholle, Roger A. Foldable boat. 3,724,011, Cl. 9-2.00f.
Schon, Erwin: *See—*
Busch, Josef; Bruck, Herbert; Schranz, Karl-Wilhelm; Schon, Erwin; and Frick, Hans-Dieter, 3,724,355.
Schon, Nikolaus: *See—*
Naumann, Gunter; Schon, Nikolaus; Schnoring, Hildegard; and Pampus, Gottfried, 3,725,313.
Schor, Ferdinand William; and Roup, Rolland R., to AMP Domestic Inc., mesne. Contact spring. 3,724,834, Cl. 267-159.000.
Schranz, Karl-Wilhelm: *See—*
Busch, Josef; Bruck, Herbert; Schranz, Karl-Wilhelm; Schon, Erwin; and Frick, Hans-Dieter, 3,724,355.
Schreiber, Olaf, to Telefunken Patentverwertungsgesellschaft m.b.H. Radar system for determining the angular deviation of a target from a reference line. 3,725,937, Cl. 343-120.000.
Schreiber, Sidney P.: *See—*
Calamari, Timothy A., Jr.; Schreiber, Sidney P.; Cooper, Albert S., Jr.; and Reeves, Wilson A., 3,724,243.
Schreyer, Ralph C., to Du Pont de Nemours, E. I., and Company. Polyester from 1,4-dimethanol-1,4 dialkyl cyclohexane and dicarboxylic organic acids. 3,725,343, Cl. 260-47.00c.
Schroder, Johann; and Van Witteveen, Roland Anton Johan Otto, to U.S. Philips Corporation. Mass which after ignition supplies heat for some time as a result of a reaction among several constituents of the mass. 3,725,153, Cl. 149-19.000.
Schroeder, Ervin E.: *See—*
Halasa, Adel F.; and Schroeder, Ervin E., 3,725,369.
Halasa, Adel F.; and Schroeder, Ervin E., 3,725,370.
Schuler, L., GmbH: *See—*
Munch, Werner; and Michael, Wolfgang, 3,724,364.
Schulman, Marvin: *See—*
Giacone, Joseph; and Schulman, Marvin, 3,725,082.
Schulmerich Manufacturing Co.: *See—*
Malta, Jacob H.; and Cassel, Harrison E., 3,725,893.
Schulz, Gerald L.; and Caiola, Robert J., to Dow Chemical Company, The. Method of preparing sulfonated styrene polymer photographic films. 3,725,109, Cl. 117-47.00a.
Schulz, Johann G. D.: *See—*
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, 3,725,471.
Schulze, Gerhard; and Heck, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the oxidation of hydrogen sulfide to elementary sulfur. 3,725,537, Cl. 423-575.000.
Schumacher, Berthold W.; and La Croix, Robert E., to Westinghouse Electric Csrporation. Corpuscular beam in the atmosphere. 3,725,633, Cl. 219-121.0eb.
Schupp, Lewis J., to General Electric Company. Photoflash lamp. 3,724,990, Cl. 431-93.000.
Schupp, Lewis J., to General Electric Company. Photoflash lamp. 3,724,991, Cl. 431-93.000.
Schuster, Wilhelm. Reinforcing structure for bodies with curved load-supporting surfaces. 3,724,144, Cl. 52-108.000.
Schutt, Hans U., to Shell Oil Company. Hydrocracking process with fluorine treat to avoid condensed polyaromatics. 3,725,244, Cl. 208-59.000.
Schutzenauer, Hans-Dieter, to Daimler-Benz Aktiengesellschaft. Control installation for balancing fuel levels in motor vehicle fuel tanks. 3,724,481, Cl. 137-101.250.
Schwartz, Hermann, to Peyer, Siegfried. Bank note testing apparatus. 3,725,667, Cl. 250-219.0dq.
Schwartz, Stephan L.: *See—*
Unger, Hans Peter Olof; Westberg, Eric J. H.; and Schwartz, Stephan L., 3,724,747.
Schwarzkopf, Daniel B.: *See—*
Oldfield, Homer R., Jr.; Rawson, Edward B.; and Schwarzkopf, Daniel B., 3,725,866.
Schwarztrauber, Manfred: *See—*
Lehari, Eckmar; and Schwarztrauber, Manfred, 3,725,901.
Schweitzer, E. O., Manufacturing Co., Inc.: *See—*
Schweitzer, Edmund O., Jr., 3,725,832.
Schweitzer, Edmund O., Jr., to Schweitzer, E. O., Manufacturing Co., Inc. Magnetic core structure. 3,725,832, Cl. 336-96.000.
Schweizerische Industrie-Gesellschaft: *See—*
Ludwig, Walter, 3,724,113.
Schwimmer, Sigmund, to United States of America, Agriculture. Flavor enhancement of allium products. 3,725,085, Cl. 99-140.00r.
Schwind, Richard G., to Nielsen Engineering & Research, Inc. Method and apparatus for obtaining mass average samples from a liquid stream. 3,724,276, Cl. 73-422.00r.
Science-Union et Cie: *See—*
Beregi, Laszlo; Hugon, Pierre; and Le Douarec, Jean-Claude, 3,725,432.
SCM Corporation: *See—*
Bowell, S. T.; Ashcroft, Robert; and Pekarek, G. E., 3,725,328.
Scopp, Howard A., to Addressograph-Multigraph Corporation. Coated vinyl film. 3,725,184, Cl. 161-6.000.
Scott, Lyle B., to Jackson, Byron, Inc. Undersea well test tree control valve and system. 3,724,501, Cl. 137-630.190.
Scott Paper Company: *See—*
Hammond, Oswyn K., 3,725,069.
Mandeville, Arthur R., 3,724,096.
Scott, Warner C., to Texas Instruments, Incorporated. Laser system having electronically selectable gain. 3,725,812, Cl. 331-94.500.
Scowcroft, Hector, to T.M.M. (Research) Limited. Methods of and apparatus for drawtwisting textile yarns or filaments. 3,724,197, Cl. 57-93.000.
Scragg, Edgar P. Method of lubricating pneumatic machines and apparatus therefor. 3,724,601, Cl. 184-56.00a.
Searle Medidata, Inc.: *See—*
Oldfield, Homer R., Jr.; Rawson, Edward B.; and Schwarzkopf, Daniel B., 3,725,866.
Sears, Roebuck and Co.: *See—*
Notko, Michael F.; and Hylak, Peter J., 3,724,399.
Seaton, Thomas: *See—*
Bowden, Roy Dennis; and Seaton, Thomas, 3,725,414.
Secrist, Walter S., to United States Steel Corporation. Cage and guide construction for a ball-type valve. 3,724,496, Cl. 137-533.130.
Seefeld, Dean E.: *See—*
Burrough, Donald E.; Scheffler, David R.; and Seefeld, Dean E., 3,724,908.
Seekircher, Richard: *See—*
Onopchenko, Anatoli; Schulz, Johann G. D.; and Seekircher, Richard, 3,725,471.
Seelbach, Heinz: *See—*
Eversberg, Gerhard; and Seelbach, Heinz, 3,725,695.

Seelbinder, David C., to Eastman Kodak Company. Method and apparatus for determining radiation transmission characteristics of a generally transparent medium. 3,724,951, Cl. 356-102.000.

Seelbinder, David C.; and Ballard, Clinton S., to Eastman Kodak Company. Method and apparatus for controlling characteristics of fogged silver halide emulsions. 3,725,071, Cl. 96-94.000.

Seely, Neil G.: *See—*
Jenkins, Gerald L.; Jungjohann, Vernon H.; Marvin, Edgar S.; and Seely, Neil G., 3,724,937.

Seibelq Georg, to Schoeller & Co. Rotating coil magnetic indicator. 3,725,909, Cl. 340-373.00r.

Seidl, Gunther: *See—*
Kuch, Heinz; Schmitt, Karl; Seidl, Gunther; and Hoffmann, Irmgard, 3,725,404.

Seifried, Walter; and Klenk, Ludwig, to Kahle Aktiengesellschaft. Process for the continuous production of multiaxially stretched tubular films of linear polyesters. 3,725,519, Cl. 264-25.000.

Seil, Kenneth F.; and Worth, Joseph H., to Eastman Kodak Company. Thermal processor. 3,725,639, Cl. 219-216.000.

Seiler, Georg. Thrust safety in socket connections of pipes. 3,724,880, Cl. 285-105.000.

Seldon, Martin M.; and Garbini, Leo J., to Varian Associates. Method and article for inhibiting gaseous permeation and corrosion of material. 3,725,719, Cl. 313-317.000.

Seliber, Joseph, to Pacific Lighting Service Co. Combination liquefied natural gas expansion and desalination apparatus and method. 3,724,229, Cl. 62-52.000.

Selle, Wolfgang H., to Lockheed Aircraft Corporation. Rotatable hatch cover for armored vehicles. 3,724,323, Cl. 89-36.001.

Sellers, Walter M., Jr., to Media Services, Inc. Bacteria identification culture medium. 3,725,203, Cl. 195-100.000.

Selman, Alan A.: *See—*
Thorn, John E.; and Selman, Alan A., 3,724,571.

Sels, Wally O.; and Paul, Alfred L., to Brock-White Co. Column form and clamp assembly. 3,724,801, Cl. 249-48.000.

Semperit Aktiengesellschaft: *See—*
Eder, Otto; and Hascic, Wladimir, 3,724,104.

Sencial, Ian Robert: *See—*
Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert, 3,725,554.

Senderoff, Seymour, to Union Carbide Corporation. Rechargeable electrochemical cell having complex metal fluoride electrolyte. 3,725,128, Cl. 136-6.000.

Sendoykas, Jack J.; and McPherson, Alexander W., to Dover Corporation. Power operated swing clamp. 3,724,836, Cl. 269-32.000.

Serbus, Ctibor; Rezac, Jan; Pribil, Stanislav; Marvan, Petr; Krejdirik, Libor; and Stoy, Artur, to Ceskoslovenska akademie ved. Sorbent, and method of manufacturing same. 3,725,291, Cl. 252-180.000.

Sergay, Dimitry B. Reversible energy absorbing bumper system. 3,724,833, Cl. 267-140.000.

Servatius, John B. Fill material compensator for an automatic hydromechanical land leveler. 3,724,556, Cl. 172-4.500.

Servo Labs, Inc.: *See—*
Cox, Robert M.; Crowley, Ernest W.; and Kilmer, Dan L., 3,724,485.

Sescosem-Societe Europeenne de Semiconducteurs et de Microelectronique: *See—*
Moreau, Jean Pierre; and Boudry, Jean Marie, 3,725,791.

Seybold, John B.: *See—*
Rubin, David; and Seybold, John B., 3,725,682.

Shane, Charles: *See—*
Dennis, John M., Jr., 3,724,883.

Shanly, Alan L., to Xerox Corporation. Wiper blade cleaning apparatus for xerographic machines. 3,724,019, Cl. 15-256.530.

Sharp Kabushiki Kaisha: *See—*
Fukuma, Yoshitakaka, 3,725,656.

Sharp, Stanley Gordon: *See—*
Sims, Arthur Albert; and Sharp, Stanley Gordon, 3,724,257.

Shavel, John, Jr.: *See—*
Morrison, Glenn C.; Shavel, John, Jr.; and Cetenko, Wiaczeslaw, 3,725,420.

Shekhter, Semen Yakovlevich: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,725,559.

Shell Oil Company: *See—*
Kiovsky, Thomas E.; and Wald, Milton M., 3,725,239.
Robinson, Joseph D.; and Vogiatzis, John P., 3,725,777.
Schutt, Hans U., 3,725,244.

Shellhause, Ronald L.: *See—*
Naismith, Thomas D.; and Shellhause, Ronald L., 3,724,605.

Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzell, Bruce E., to Merck & Co., Inc. Substituted indenyl acetic acids in the treatment of pain fever or inflammation. 3,725,548, Cl. 424-303.000.

Shepard, John C., Jr., to Nalco Chemical Company. Lead fluoroborates as redistribution catalysts. 3,725,447, Cl. 260-437.00r.

Shephard, Kenneth P.: *See—*
Beal, Philip F.; and Shephard, Kenneth P., 3,725,392.

Shepherd, John Michael: *See—*
Greenwood, Robert; and Shepherd, John Michael, 3,724,194.

Sheppard, Chester Stephen: *See—*
D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, 3,725,455.

Sheridan, David S.; and Jackson, Isaac S., to Sheridan, David S., mesne. Method of manufacture of ballon-type catheters. 3,725,522, Cl. 264-138.000.

Sheridan, David S., mesne: *See—*
Sheridan, David S.; and Jackson, Isaac S., 3,725,522.

Sherman Car Wash Equipment Company: *See—*
Beer, Carl C.; and Larson, Sherman L., 3,724,390.

Sherman, Robert P., to United States of America, Navy. VHF Travelling wave loop antenna. 3,725,936, Cl. 343-119.000.

Sherwin-Williams Company, The: *See—*
Warneke, Carl J., 3,725,114.

Sherwood Medical Industries, Inc.: *See—*
Burlis, Norbert W.; and Corbett, Joseph H., 3,724,985.
Gerard, William L.; and Pregont, Jack E., 3,724,654.

Shevlin, Thomas S., to Minnesota Mining and Manufacturing Company. Casserole for storing and cooking foodstuffs. 3,725,645, Cl. 219-52.000.

Shiba, Keisuke; Hinata, Masanao; Yamasue, Koutaro; and Kondo, Tokiharu, to Fuji Photo Film Co., Ltd. Fogged, direct positive silver halide emulsions containing hydroxyphthalein dyes and sulfonated compounds. 3,725,074, Cl. 96-122.000.

Shigehiro, Kosuke: *See—*
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.

Shigeru, Mitsui. Semiconductor negative resistance device. 3,725,821, Cl. 331-107.00g.

Shiihara, Isao: *See—*
Ando, Tadanao; Kataoka, Seiichi; and Shiihara, Isao, 3,725,347.

Shill, Karl. Surgical pump. 3,724,973, Cl. 417-326.000.

Shim, Kyung S., to Stauffer Chemical Company. Oligomer composition from alkyl amine and sulfur chlorides. 3,725,481, Cl. 260-583.0ee.

Shimada, Keizo: *See—*
Nagahama, Shizuo; Shimada, Keizo; and Kurozumi, Seizi, 3,725,490.

Shimada, Yoshio: *See—*
Watanabe, Kiyoshi; Shimada, Yoshio; Kawaharada, Hajime; Suzuki, Kenji; and Tanaka, Fumio, 3,725,200.

Shimely, Jesse H.; and Archer, Edward D., to Texaco Inc. Silanized crystalline alumino-silicate. 3,725,302, Cl. 252-431.00r.

Shimizu, Yoichi: *See—*
Nagoya, Tsutomu; Fujima, Yoshito; and Shimizu, Yoichi, 3,725,437.

Shimomura, Jun, to Nippon Kogaku K.K. Safety device for a cassette and adapter assembly for cameras. 3,724,352, Cl. 95-71.000.

Shimono, Kenichi: *See—*
Suyama, Fujio; Yamamoto, Tokuo; Shimono, Kenichi; Kuwahara, Hirosi; Ishii, Masao; and Watanabe, Ichiro, 3,725,195.

Shinoda, Motoyuki: *See—*
Mayuzumi, Harutaka; Shinoda, Motoyuki; and Akizuki, Kosuke, 3,724,046.

Shiomi, Masano; and Tadataka, Narumi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Collision force absorption device. 3,724,603, Cl. 188-1.00c.

Shirai, Takeaki; Kato, Masumi; and Oshikawa, Kiyomitsu, to Nippondenso Kabushiki Kaisha. Means for opening and closing a window assembly of a vehicle. 3,724,133, Cl. 49-349.000.

Shirato, Akira; Nishizawa, Hitoshi; and Sawada, Seizo, to Showa Electric Wire & Cable Co., Ltd. Self-adhesive insulating composition. 3,725,330, Cl. 260-33.6aq.

Shoei Kakoh Co., Ltd.: *See—*
Kamata, Eitaro, 3,723,992.

Shoemaker, James C., to Symons Corporation. Self-contained waler clamp for concrete wall form. 3,724,806, Cl. 249-219.00w.

Shono, Tetsuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera flashgun shoe. 3,724,344, Cl. 95-11.001.

Short, Oliver A.; and Weaver, Richard V., to Du Pont du Nemours, E. I., and Company. Process for making gold powder. 3,725,035, Cl. 75-.50a.

Showa Denko K.K.: *See—*
Kawase, Butaro; Kojima, Iwao; and Otani, Kunio, 3,725,530.

Showa Electric Wire & Cable Co., Ltd.: *See—*
Shirato, Akira; Nishizawa, Hitoshi; and Sawada, Seizo, 3,725,330.

Shreve, Russell L. Brake actuated mechanism. 3,724,604, Cl. 188-2.00d.

Shriver, Seymour J.: *See—*
Preston, Leonard A.; and Shriver, Seymour J., 3,724,077.

Shu, Stephen K.: *See—*
Albertini, Eugene J.; and Shu, Stephen K., 3,725,947.

Shulock, Charles, to Carrier Corporation. Turbine construction. 3,724,969, Cl. 415-190.000.

Sicuteri, Federigo: *See—*
Giotti, Alberto; and Sicuteri, Federigo, 3,725,553.

Sidaplax: *See—*
Vermeulen, Emile R., 3,724,161.

Siebart, Manfred: *See—*
Koppen, Gerhard; Dobring, Wilfried; and Siebart, Manfred, 3,725,839.

Siegart, William R.: *See—*
Patmore, Edwin L.; Siegart, William R.; and Chafetz, Harry, 3,725,468.

Sieglein, Werner: *See—*
Gawlick, Heinz; Marondel, Gunther; Sieglein, Werner; Wasser, Wolfgang; and Bendler, Hellmut, 3,724,381.
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, to Ciba-Geigy A.G. Heterocyclic compounds containing ethylene double bonds and process for their manufacture. 3,725,395, Cl. 260-240.0ca.
Siemens Aktiengesellschaft: *See—*
Greubel, Waldemar, 3,725,899.
Hjorth, Bo, 3,725,690.
Kemper, Jurgen; and Schenk, Erwin, 3,725,860.
Klein, Peter, 3,725,587.
Koppen, Gerhard; Dobring, Wilfried; and Siebart, Manfred, 3,725,839.
Lehari, Eckmar; and Schwarztrauber, Manfred, 3,725,901.
Ohmann, Friedrich; Otto, Rudolf; and Wiedenmann, Wolfgang, 3,725,900.
Olsen, Willi; and Schlosser, Klaus, 3,725,567.
Sachs, Harald, 3,725,880.
Schenk, Erwin; and Biedermann, Kurt, 3,725,796.
Schmidt, Fritz, 3,725,565.
Touchy, Wolfgang, 3,725,284.
Signal Oil and Gas Company: *See—*
Wheeler, Douglas W., 3,725,264.
Silent Channel Products Limited: *See—*
Reeve, William Ernest, 3,724,155.
Siles, Gregory, Co.: *See—*
Cirino, John C., 3,725,890.
Sills, Albert J. Swab with foam plastic wiping tip. 3,724,018, Cl. 15-244.00r.
Silsby, Stanley D., to Colts Industries Operating Corporation, mesne. Rate reducer. 3,724,325, Cl. 89-131.000.
Silva, John R., to General Signal Corporation. Apparatus for digitizing noisy time duration signals which prevents adverse effects of contact bounce. 3,725,680, Cl. 307-268.000.
Silver, Gary L.: *See—*
Deaton, Ronald L.; and Silver, Gary L., 3,725,294.
Simmler, Walter: *See—*
Golitz, Hans Dietrich; Merten, Rudolf; Noll, Walter; and Simmler, Walter, 3,725,449.
Simmons, Bjorn Herman Olof, to Aktiebolaget Bofors. Device for a projectile. 3,724,380, Cl. 102-60.000.
Simon, Charles J.: *See—*
Krock, Elmer W.; and Simon, Charles J., 3,725,599.
Simon, Friedhelm, to Singer Company, The, mesne. Snap-on zipper foot. 3,724,407, Cl. 112-240.000.
Simons, John C., to United States of America, Air Force. Long line loiter technique. 3,724,817, Cl. 258-1.400.
Simpson, Glenn. Vehicle drawbar assembly. 3,724,874, Cl. 280-408.000.
Sims, Arthur Albert; and Sharp, Stanley Gordon, to Vandervell Products Limited. Apparatus for manufacturing thin wall flexible bearing liners. 3,724,257, Cl. 72-324.000.
Sinclair-Koppers Company, mesne: *See—*
Rode, D. John, 3,724,976.
Singer Company, The: *See—*
Daman, Louis F., 3,724,282.
Francini, Joseph P.; and Verdone, Michael A., 3,724,652.
Hare, George H., 3,725,873.
Marsh, Walter H. W.; and Coulombe, Lionel J., 3,724,404.
Verdone, Michael A., 3,724,134.
Woycechowsky, Brian J., 3,725,563.
Singer Company, The, mesne: *See—*
Quick, George R.; and Sowter, George R., 3,725,906.
Simon, Friedhelm, 3,724,407.
Sioles, George W.: *See—*
Northrop, John H.; Jones, Eugene C.; Sioles, George W.; and Mellette, Gary W., 3,724,860.
Sipe, Gary L.: *See—*
Butler, Gene R.; and Sipe, Gary L., 3,724,684.
Siple, Ralph J., to United States of America, Atomic Energy Commission. Horizontal vehicle mounted omnidirectional loop antenna having a shorting stub. 3,725,940, Cl. 343-713.000.
Sitges, F. J., to Asturiana de Zinc, S.A. Hydraulic process for removing the zinc deposited on zinc electrolysis cathodes. 3,724,471, Cl. 134-34.000.
Sitts, Kenneth O. Device for forming box pleats. 3,724,729, Cl. 223-35.000.
Sjoberg, Nils W.: *See—*
Perry, Reginald P.; and Sjoberg, Nils W., 3,724,013.
Skijor Manufacturing Company: *See—*
Kaplan, Irving Leonard, 3,724,866.
Skorcz, Joseph A.; Suh, John T.; and Judd, Claude I., to Colgate-Palmolive Company. Derivatives of 2,1-benzisothiazoline. 3,725,426, Cl. 260-301.000.
Skoyles, Derek Robert, to U.S. Philips Corporation. Anti-lock brake systems. 3,724,914, Cl. 303-21.00f.
Slana, Matthew Francis, to Bell Telephone Laboratories, Incorporated. Communication arrangement allowing network path testing. 3,725,614, Cl. 179-175.20r.
Slater, William L.; and Ahlborn, John C., to Texaco Inc. Fuel composition for producing synthesis gas or fuel gas. 3,725,020, Cl. 44-50.000.
Slavinski, Antony. Spray devices for hair lacquer. 3,724,723, Cl. 222-110.000.
Sletten, Carlyle J.; Schell, Allan C.; Mack, Richard B.; Goggins, William B., Jr.; and Blacksmith, Philipp, to United States of America, Air Force. Radar phase comparison method and system for object recognition. 3,725,917, Cl. 343-55.00a.
Slezak, Imogene F. Teaching garment. 3,724,101, Cl. 35-35.00r.
Sloan, Cephas H.: *See—*
Reynolds, Jefferson W.; and Sloan, Cephas H., 3,724,469.
Sloan, Earl L., III: *See—*
Webster, Jonathan C.; Sloan, Earl L., III; and Ganssen, Alexander, 3,725,798.
Slobodnik, Andrew J., Jr., to United States of America, Air Force. High coupling low diffraction acoustic surface wave delay line. 3,725,827, Cl. 333-30.000.
Slocum, Charles W.: *See—*
Ehrens, Henry; and Slocum, Charles W., 3,725,757.
Slocum, Fred H., to Robroy Industries. Explosion proof junction box. 3,724,706, Cl. 220-3.800.
Smaller, Philip. Double coated storage medium for contact transfer recording. 3,725,611, Cl. 179-100.20a.
Smalley, Richard, to Smalley, Richard, (Engineering) Limited. Excavating and/or loading devices. 3,724,693, Cl. 214-138.00c.
Smalley, Richard, (Engineering) Limited: *See—*
Smalley, Richard, 3,724,693.
Smead, David E., to Minnesota Mining and Manufacturing Company. System for reproducing digital information. 3,725,646, Cl. 235-61.11d.
Smeaton, John R.: *See—*
Marshall, Hamilton W., Jr.; and Smeaton, John R., 3,725,204.
Smith, A. O., Corporation: *See—*
Ebling, Hilmer F., 3,725,521.
Smith, A. O.,-Inland, Inc.: *See—*
Huseby, Robert A., 3,725,142.
Smith, Donald A.: *See—*
Wolfarth, Eugene F.; Smith, Donald A.; Farran, Charles F.; and Dappen, Glen M., 3,725,063.
Smith, Donald F.: *See—*
Somerville, James; Smith, Donald F.; and Yaccarino, Joseph N., 3,724,374.
Smith, E. Quimby, Jr., to United States of America, Navy. Combined rocket-ram-jet aircraft. 3,724,216, Cl. 60-245.000.
Smith, Earl W. Adjustable shower fixture. 3,724,760, Cl. 239-282.000.
Smith, Edson W., to American La France, Inc., mesne. Power transmission with lubricating means. 3,724,598, Cl. 184-6.100.
Smith, Harry A.; and Kobel, Erwin H., to Dow Chemical Company, The. Phenol-formaldehyde adhesive resins containing poly(C3-C4 alkyleneoxy)glycols. 3,725,349, Cl. 260-58.000.
Smith, Horace L., Jr., to Smitherm Industries, Inc. Apparatus for processing particulate solids. 3,724,090, Cl. 34-57.00d.
Smith, Jack D., to American Broculture, Inc., mesne. Electro-osmosis system. 3,725,233, Cl. 204-180.00p.
Smith, James C.: *See—*
Keig, George A.; Smith, James C.; and Watts, John M. J., 3,725,092.
Smith, James McC. Photographic processing apparatus. 3,724,354, Cl. 95-93.000.
Smith, John Hugh: *See—*
Ashworth, John Vernon; and Smith, John Hugh, 3,725,569.
Smith, Joseph Cyril, to British Steel Corporation. Chain retaining device. 3,724,035, Cl. 24-116.00r.
Smith, Leon; Calvert, David W.; Robert, Andre; Viallet, Andre; and Pauw, Daniel R., to South African Pulp and Paper Industries, Limited and L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Treatment of alkaline pul with an acidic medium followed by oxygen bleaching and delignification. 3,725,194, Cl. 162-65.000.
Smith, Lloyd H.: *See—*
Zabelka, Richard J.; and Smith, Lloyd H., 3,724,319.
Smitherm Industries, Inc.: *See—*
Smith, Horace L., Jr., 3,724,090.
Smitherman, Eugene A. Apparatus for handling column of drill pipe or tubing during drilling or workover operations. 3,724,567, Cl. 175-203.000.
Smyth, George F.: *See—*
Brown, Omar L.; and Smyth, George F., 3,724,063.
Snam Progetti S.p.A.: *See—*
Arrighetti, Sergio; Corradini, Giorgio; and Cesca, Sebastiano, 3,725,372.
Snavely, Earl S., Jr., to Mobil Oil Corporation. Well treating method to remove paraffin deposition. 3,724,552, Cl. 166-304.000.
Snavely, Earl S., Jr.; Bertness, Theodore A.; and Morris, Richard L., to Mobil Oil Corporation. Paraffin well treatment method. 3,724,553, Cl. 166-304.000.
Sneider Electronic Systems, Inc.: *See—*
Sneider, Vincent R., 3,725,887.
Sneider, Vincent R., to Sneider Electronic Systems, Inc. Radio transmitting alarm system. 3,725,887, Cl. 340-224.000.
Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Ando, Satoshi; Matsui, Masao; and Ogata, Fumimaro, 3,725,192.
Snulova, Lidia Dorofeevna: *See—*
Lyass, Abram Moiseevich; Snulova, Lidia Dorofeevna; Borsuk, Pavel Afanasievich; Tsyruleva, Anna Ivanovna; and Teplyakov, Sergei Dmitrievich, 3,725,090.
Snyder, Clifford H., Jr. Tubing coupling. 3,724,879, Cl. 285-101.000.

Snyder, Stephen L. Ram air glide parachute. 3,724,789, Cl. 244-145.000.
Sobran, Michael J.: *See—*
Strauss, Leo; and Sobran, Michael J., 3,724,637.
Societa Italiana Resine S.p.A.: *See—*
Barilli, Filippo; Lugo, Luigi; Di Fiore, Lucio; and Reni, Cesare, 3,725,255.
Cavenaghi, Carlo; Di Fiore, Lucio; Barilli, Filippo; and Calcagno, Benedetto, 3,725,257.
Societa Italiana Telecommunicizioni Siemens S.p.A.: *See—*
Palombari, Maurizio, 3,725,593.
Societa Italiana Telecomunicizioni Siemens S.p.A.: *See—*
Palombari, Maurizio; and Di Biago, Luciano, 3,725,591.
Societe Anonyme D.B.A.: *See—*
Chevreux, Gerard, 3,724,911.
Societe Anonyme dite: Societe Industrielle pour Li Fabrication des Antibiotiques (S.I.F.A.): *See—*
Boissier, Jacques R.; and Ratouis, Roger, 3,725,415.
Societe Anonyme Societe Industrielle de Combustible Nucleaire: *See—*
Chaulet, Roger Louis; Guichard, Claude Pierre Albert Louis; Menissier, Pierre Lucien; and Soret, Jean-Claude Georges, 3,724,529.
Societe Anonyme: dite THIMONNIER & Cie: *See—*
Roussel, Jean, 3,724,163.
Societe Anonyme: Produits Chimiques Ugine Kuhlmann: *See—*
Viennot, Pierre, 3,725,187.
Societe de Fabrication d'Instruments de Mesure SFIM: *See—*
Delaunay, Jacques, 3,725,691.
Societe d'Exploitation des Brevets Neiman S.A.: *See—*
Schaumburg, Gunter, 3,724,244.
Societe Fibes Lille-Cail: *See—*
Retali, Roger; Dambrine, Francis; Giorgi, Jean Claude; and Windal, Georges, 3,725,127.
Societe Fulmen: *See—*
Brocart, Rene; and Bourez, Henri, 3,724,051.
Societe Genevoise d'Instruments de Physique: *See—*
Koulicovitch, Maurice, 3,724,959.
Societe Industrielle Honeywell Bull (Societe Anonyme): *See—*
Picard, Michel, 3,724,371.
Societe Italiana Resine S.p.A.: *See—*
Lugo, Luigi; Calcagno, Benedetto; and Reni, Cesare, 3,725,256.
Societe Lignes Telegraphiques et Telephoniques: *See—*
Chiron, Bernard; and Puyhaubert, Jean, 3,725,826.
Societe Nationale des Petroles d'Aquitaine: *See—*
Amiard, Yves; and Bellissent, Jean-Paul, 3,725,366.
Donche, Alain; Thibault, Claude; Arretz, Emmanuel; and Pfister, Alain, 3,725,394.
Societe Nationale Industrielle Aerospatiale: *See—*
Allard, Pierre; Laparre, Jacques; and Lemaitre, Claude, 3,724,219.
Societe Rhodiaceta: *See—*
Ohayon, Gabriel, 3,724,040.
Societe S.E.C.O.R.: *See—*
Bardiau, Roger, 3,724,300.
Soffer, Ernst. Power driven painting device. 3,724,016, Cl. 15-98.000.
Sokoloff, Boris Alexandre. Computer device. 3,725,869, Cl. 340-172.500.
Sokolsky, Valery Nikolaevich; and Mamaev, Igor Ivanovich. Device for preventing a corona discharge from assuming the form of a spark discharge in electrostatic painting apparatus. 3,725,738, Cl. 317-3.000.
Sola Basic Industries, Inc.: *See—*
Loomis, Donald C., 3,725,588.
Solin, Edward P.; and Post, Russell, to Arctic Roof Deicing Corporation. Heat radiating assembly and apparatus for permitting ice blocked water to drain off of house roofs. 3,725,638, Cl. 219-213.000.
Sollami, Blase J.; Lundeen, Howard R.; and Gerth, Bruce F., to Bendix Corporation, The. Composite insulation for cryogenic vessel. 3,724,228, Cl. 62-50.000.
Solomon, Elias E., to Pyrotector, Incorporated. Detector system. 3,725,888, Cl. 340-258.00a.
Solomon, Thomas S., to Goodrich, B. F., Company, The. EPDM rubber fire cord adhesive from dicyclopentadiene latex and resorcinol-aldehyde resin. 3,725,326, Cl. 260-29.300.
Somers, Jess J.: *See—*
Kavthekar, Keshav S.; and Somers, Jess J., 3,724,357.
Somers, Robert R.: *See—*
Patula, Edward J.; Roberts, William L.; and Somers, Robert R., 3,725,140.
Somerville, James; Smith, Donald F.; and Yaccarino, Joseph N., to United States of America, Navy. Underwater sound source. 3,724,374, Cl. 102-7.000.
Sonnenfeld, Richard J.: *See—*
Trepka, William J.; and Sonnenfeld, Richard J., 3,725,376.
Sony Corporation: *See—*
Iida, Kazumi, 3,725,586.
Kurikawa, Hiromichi; and Kubota, Yasuharu, 3,725,572.
Wakamiya, Kinji, 3,725,751.
Wakamiya, Kinji, 7,325,751.
Yoshida, Susumu; and Ishigaki, Yoshio, 3,725,725.
Soret, Jean-Claude Georges: *See—*
Chaulet, Roger Louis; Guichard, Claude Pierre Albert Louis; Menissier, Pierre Lucien; and Soret, Jean-Claude Georges, 3,724,529.
South African Pulp and Paper Industries, Limited: *See—*
Smith, Leon; Calvert, David W.; Robert, Andre; Viallet, Andre; and Pauw, Daniel R., 3,725,194.
Southwire Company: *See—*
Bishop, Dwight; and Baskin, Ronald W., 3,724,189.
Southworth Machine Company: *See—*
Thompson, Gene C.; Radomski, Joseph W.; and Wilson, David E., 3,724,089.
Sowter, George R.: *See—*
Quick, George R.; and Sowter, George R., 3,725,906.
Spaar, Gerd, to Clouth Gummiwerke Aktiengesellschaft. Conveyor belt construction. 3,724,645, Cl. 198-193.000.
Spain, Raymond G. Refurbishable brake disc. 3,724,612, Cl. 188-218.0xl.
Spangenberg, Stanley F., to Dow Chemical Company, The. Preparation of alkaline earth metal titanate. 3,725,539, Cl. 423-598.000.
Spanos, William M., to International Telephone and Telegraph Corporation. Steerable null antenna arrangement. 3,725,929, Cl. 343-844.000.
Spanos, William M., to International Telephone and Telegraph Corporation. Turnstile antenna. 3,725,943, Cl. 343-797.000.
Spector, Marshall L.; Jones, Robert D.; and McDowell, Curtis S., to Air Products and Chemicals, Inc. Activated sludge sewage treatment process and system. 3,725,258, Cl. 210-7.000.
Spectrol Electronics Corporation: *See—*
Hubert, Gustav, 3,725,838.
Tygard, Charles M.; and Cameron, James H., 3,724,067.
Spence, Gerald D.: *See—*
Staar, Anthony J.; and Spence, Gerald D., 3,724,712.
Spencer, Robert Graham: *See—*
Ault, Cyrus Frank; and Spencer, Robert Graham, 3,725,790.
Sperberg, Lawrence R. Method for manufacture of a more uniform pneumatic tire. 3,725,165, Cl. 156-123.000.
Sperry, Lowell L., to PPG Industries, Inc. Tempering glass sheets with liquid flows. 3,725,024, Cl. 65-114.000.
Sperry Rand Corporation: *See—*
Black, Stanley H.; and Formeister, Richard B., 3,725,938.
Butler, Gene R.; and Sipe, Gary L., 3,724,684.
Fleischer, Herman J.; Lipsky, Philip; and Tiblin, Bert V., 3,725,918.
Hurlburt, Joseph C., 3,724,183.
Mager, Donald V., 3,725,789.
Nolt, Edwin B., 3,724,363.
Sperry Sun Well Surveying Company: *See—*
Lichte, Henry P., Jr., 3,724,086.
Spiro Engineering Limited: *See—*
Wichsteed, Robert James; and Wood, David Henry, 3,724,414.
Splettstoeszer, Wallace G.: *See—*
Thyberg, Paul D.; and Splettstoeszer, Wallace G., 3,724,402.
Spofa, United Pharmaceutical Works: *See—*
Protiva, Miroslav; Pelz, Karel; and Metysova, Jirina, 3,725,409.
Sprague, Theodore S., to Babcock & Wilcox Company, The. Once-through vapor generator. 3,724,532, Cl. 165-1.000.
Sprenger, Manfred: *See—*
Lang, Willi; and Sprenger, Manfred, 3,724,358.
Sproule, Robert Stanley, to Dominion Engineering Works, Limited. Hydraulic machine crown aeration. 3,724,966, Cl. 415-1.000.
Squibb, E. R., & Sons, Inc.: *See—*
Krapcho, John, 3,725,403.
Srail, Raymond C.: *See—*
Makinen, Winnifred B.; and Srail, Raymond C., 3,724,107.
St. John, Douglas F.: *See—*
Richards, Raymond S.; and St. John, Douglas F., 3,724,446.
Staar, Anthony J.; and Spence, Gerald D., to Container Corporation of America. Container for bulk shipment of corrosive liquids or the like. 3,724,712, Cl. 220-63.00r.
Stabile, Lucio, to Vanguard U.S. Systems for driving reels at controlled speed and power and improved apparatus for effecting such driving. 3,725,755, Cl. 318-6.000.
Stabilus Industrie und Handelsgesellschaft mbH: *See—*
Freitag, Herbert; and Westerteiger, Wilhelm, 3,724,797.
Stache, Ulrich; Fritsch, Werner; Haede, Werner; Radscheit, Kurt; and Lindner, Ernst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 3-N-alkyl-amino-cardenolides and process for their manufacture. 3,725,393, Cl. 260-239.570.
Stackpole Carbon Company: *See—*
Quirk, Virgil P.; and Titlar, James M., 3,725,718.
Stadler, Siegfried. Device for flame treating surface. 3,724,761, Cl. 239-286.000.
Stadtmiller, Malcolm L. Quill stop and gauge therefor. 3,724,963, Cl. 408-14.000.
Staff & Schwarz G.m.b.H.: *See—*
Hesse, Kurt, 3,725,840.
Stafford, Thomas S.: *See—*
Clark, William A., IV; Salmond, Kent A.; and Stafford, Thomas S., 3,725,864.
Stahlfeld, Donald L.: *See—*
Carr, Norman L.; Kramer, Sheldon J.; and Stahlfeld, Donald L., 3,725,653.
Staib, John H.: *See—*

Wagensommer, Joseph; Lauria, Richard J.; and Staib, John H., 3,725,364.

Stalego, Charles J.: *See—*
Trout, Robert G.; and Stalego, Charles J., 3,725,021.

Staley, A. E., Manufacturing Company: *See—*
Hanson, Cleo E.; and Tuschhoff, John V., 3,725,386.

Stalling, David L.; and Tindle, Roger C., to United States of America, Interior. Separation of pesticides from lipids by gel permeation chromatography. 3,725,260, Cl. 210-31.00c.

Stamets, Wm. K., Company: *See—*
Rinaldo, Michael S., 3,724,303.

Stamm, Walter, to Stauffer Chemical Company. Regeneration of basic alumina used as a catalyst in dehydrohalogenation of beta-haloalkylphosphonate esters. 3,725,300, Cl. 252-412.000.

Stamm, Walter, to Stauffer Chemical Company. Thiol derivatives of olefin-maleic anhydride copolymers. 3,725,508, Cl. 260-897.00c.

Standard Brands Incorporated: *See—*
White, William Harold; and Dworschack, Roberg George, 3,725,202.

Standard Oil Company: *See—*
Traise, Thornton P.; Watson, Roger W.; and Littel, Randel O., 3,725,480.

Stanford, James R.: *See—*
Troscinski, Edwin S.; and Stanford, James R., 3,724,551.

Stanford Research Institute: *See—*
Cornsweet, Tom N.; and Crane, Hewitt D., 3,724,932.

Stang, Paul F., to Lockheed Aircraft Corporation. High-frequency notch-excited antenna. 3,725,941, Cl. 343-708.000.

Stanke, Joseph G. Adhesive composition. 3,725,096, Cl. 106-90.000.

Stanley, Charles C.; and Kropp, John L., to TRW Inc. Apparatus and method for continuously detecting oxygen in a gas stream. 3,725,658, Cl. 250-71.00r.

Stanley, John Edwin, to Duo-Flex Corporation. Electrical ceiling raceway. 3,725,568, Cl. 174-48.000.

Stanley, Michael R.: *See—*
Latone, Salvatore; and Stanley, Michael R., 3,724,422.

Stansell, Alpheus F.: *See—*
Bennett, Eugene E.; and Stansell, Alpheus F., 3,725,883.

Starks, Charles M., to Continental Oil Company. Process for preparing cyano-compounds. 3,725,458, Cl. 260-465.100.

Staros, Filipp Georgievich. Device for ultrasonic broaching of a group of holes. 3,724,566, Cl. 175-108.000.

Staschewski, Alfred; Pflaum, Rudolf; and Martin, Helmut, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Method for improving performance of high frequency cable. 3,725,139, Cl. 148-6.310.

Staubli Ltd.: *See—*
Kleiner, Walter, 3,724,510.
Kleiner, Walter, 3,724,511.

Stauffer Chemical Company: *See—*
Goswami, Jagadish C.; and Jin, Jung, Il, 3,725,359.
Kraft, Paul; and Altscher, Siegfried, 3,725,509.
Shim, Kyung S., 3,725,481.
Stamm, Walter, 3,725,300.
Stamm, Walter, 3,725,508.
Uhing, Eugene H., 3,725,466.
Walsh, Edward Nelson, 3,725,512.

Stauffer, Russell A., to International Business Machines Corporation. Electroscopic powder feeding apparatus utilizing rotating helical members. 3,724,725, Cl. 222-240.000.

Stearns, Milo E.; and Taylor, Wilbur S., to Vanderbilt, R. T., Company, Inc. Zinc di (lower alkyl) dithiocarbamates as mold inhibitors for latex paints. 3,725,327, Cl. 260-29.6mm.

Steelcase Inc.: *See—*
Faiks, Frederick S.; and Buhk, Randall P., 3,724,897.

Steele, Richard F., to Oton, Edward, Jr., Ceramic Foundation, The. Self-supporting fusible pyrometric device. 3,724,272, Cl. 73-358.000.

Stefanucci, Arthur; Harnisch, Douglas R.; Coogan, Joseph E., III; and Scarsella, Edward L., to General Foods Corporation. Coffee of improved aroma and freshness retention. 3,725,076, Cl. 99-68.000.

Steiber, Theodore E. Safe. 3,724,400, Cl. 109-53.000.

Stein, Werner; Plapper, Jurgen; and Willmund, Wolf-Dieter, to Henkel & Cie G.m.b.H. Fat-liquoring agents for leather and skins. 3,724,999, Cl. 8-94.230.

Steiner, Erich Hans: *See—*
Sachtleben, Carl; and Steiner, Erich Hans, 3,724,734.

Stelber Industries Inc.: *See—*
Cristie, Martin, 3,724,865.

Stenzel, Hans-Dieter, to Kabel- und Metallwerke Gutehoffnungshutte. Method and equipment for completing connection of cable ends. 3,725,162, Cl. 156-53.000.

Stepan Chemical Company: *See—*
Blackwood, John C.; Hook, Edwin O.; and Beck, Walter, 3,725,476.
Nelson, Douglas Carlyle; and Knaggs, Edward Andrew, 3,725,290.

Stephenson, John, to United Kingdom Atomic Energy Authority. Particle separation in a gaseous fluid. 3,724,658, Cl. 209-143.000.

Steppan, Hartmut: *See—*
Luders, Walter; Steppan, Hartmut; and Klupfel, Kurt-Walter, 3,725,356.

Sterling Drug Inc.: *See—*
Ludueni, Froilan P., 3,725,552.

Sterling, Walter S., to Pneumatic Scale Corporation. Separating and sorting apparatus. 3,724,656, Cl. 209-73.000.

Sterly, Glenn E.: *See—*
Fanella, Robert J.; Marcinkus, Donald W.; and Sterly, Glenn E., 3,724,779.

Stevens, Don L.: *See—*
Niles, Eart T.; and Stevens, Don L., 3,725,152.

Stevens, Robert. Racket with string tension adjusting means. 3,724,850, Cl. 273-73.00e.

Stevens, Simon, to U.S. Philips Corporation. Stretcher. 3,724,005, Cl. 5-81.00r.

Stevenson, Thomas E.: *See—*
Friedline, Leslie E.; Stevenson, Thomas E.; and Weber, Lee A., 3,725,949.

Steward, John H.: *See—*
Ladouceur, Harold A.; and Steward, John H., 3,724,520.

Stewart, Victor E., Jr., to McGraw-Edison Company. Apparatus for measuring electrical energy consumption. 3,725,774, Cl. 324-142.000.

Stiegelmeyer, Joh., & Co., G.m.b.H.: *See—*
Behrens, Gunter, 3,724,004.

Stilwell, Robert E.: *See—*
Cassady, Henry W., Jr.; and Stilwell, Robert E., 3,724,168.

Stine, Roy L., to Phillips Petroleum Company. Oxidative dehydrogenation. 3,725,493, Cl. 260-680.00e.

Stoeck, Georg; Budka, Heinz-Gunter; Topfmeier, Fritz; and Gradel, Wolf-Dietrich, to Boehringer Mannheim GmbH. Preparation of L-3,4-dihydroxy-phenyl-alanine. 3,725,465, Cl. 260-501.110.

Stoffel Seals Corporation: *See—*
Ruegg, Erwin A., 3,724,109.

Stolz, Albert: *See—*
Andres, Rudolf; Stolz, Albert; and Moller, Hermann, 3,724,752.

Stoneburner, Jerry L. Hot coil rack. 3,724,675, Cl. 211-13.000.

Stoner, Glenn E., to Research Corporation. Electrochemical inactivation of pathogens. 3,725,226, Cl. 204-149.000.

Stoy, Artur: *See—*
Serbus, Ctibor; Rezac, Jan; Pribil, Stanislav; Marvan, Petr; Krejdirik, Libor; and Stoy, Artur, 3,725,291.

Strain, Robert Allen, to International Telephone and Telegraph Corporation. Waterproof high voltage connection apparatus. 3,725,846, Cl. 339-61.00r.

Strauss, Leo; and Sobran, Michael J., to Glass Containers ONTAINERS Corporation, mesne. Apparatus for pick-up and transfer of containers from lehr conveyor to cross conveyor. 3,724,637, Cl. 198-21.000.

Streck, Friedrich, to Rigips-Stempel GmbH. & Co., KG. Insert for treating fluids and gases. 3,724,825, Cl. 261-95.000.

Streich, Federico; Gold, Alberto Vargas; Oliversas, Jose Ma Bonastre; and Ventura, Fernando Fernandez. Construction of mechanical presses. 3,724,311, Cl. 83-590.000.

Streisand, Kenneth, to Bell Telephone Laboratories, Incorporated. Calling line identification system. 3,725,597, Cl. 179-18.0fh.

Striegler, John H. Slim hole drilling electric power unit. 3,724,562, Cl. 173-57.000.

Stromer, Joseph R., to General Motors Corporation. Shock absorber with welded piston. 3,724,615, Cl. 188-322.000.

Stromnes, Axel, to Atlas Copco Aktiebolag. Drill boom with feed direction sensing and control. 3,724,559, Cl. 173-4.000.

Stromquist, Michael E., to Anthony's Manufacturing Company, Inc. Door and door mounting frame. 3,724,129, Cl. 49-70.000.

Stuart, Alexander: *See—*
Wood, Hamish C. S.; and Stuart, Alexander, 3,725,408.

Stuart, Charles Edward. Reference plate with outriggers for dental work. 3,724,099, Cl. 32-19.000.

Studer, Richard L.: *See—*
Munch, Walter, Jr.; and Studer, Richard L., 3,725,562.

Sturiale, Louis A.: *See—*
Cantrell, Roger E.; and Sturiale, Louis A., 3,724,062.

Sturt, Alan Charles, to BP Chemicals Limited. Polymerisation process. 3,725,375, Cl. 260-92.80w.

Sturzinger, Oskar Edwin, to Anstalt Europaische Handelsgesellschaft. Circuit for enciphering device. 3,725,579, Cl. 178-22.000.

Suda, Kazuyoshi: *See—*
Katagiri, Takeo; Hiromori, Kunio; Yoshimura, Shoichiro; Suda, Kazuyoshi; and Tanaka, Jinichi, 3,724,657.

Sudduth, Jackie Wayne: *See—*
Maher, James Bernard; and Sudduth, Jackie Wayne, 3,724,227.

Sudribin, Leon P.; and Kaiser, Paul, to Pennwalt Corporation. Cathodic protection method. 3,725,225, Cl. 204-147.000.

Sugawara, Tsunenori; and Mase, Jiro, to Nippon Kokan Kabushiki Kaisha. Charge distributing apparatus for blast furnaces. 3,724,689, Cl. 214-36.000.

Sugden, Harry, Jr., to Emerson Electric Co. Two stage flow control system and pilot. 3,724,808, Cl. 251-30.000.

Sugimori, Tsunetake; Tsukada, Yoji; and Tazuke, Yasuhiko, to Marukin Shoyu Company, Limited. Manufacture of uridine-5-diphosphoglucuronic acid. 3,725,201, Cl. 195-28.00n.

Sugita, Keiji; Mochimaru, Hideaki; and Watanabe, Toshio, to Kabushiki Kaisha Ricoh. Light intercepting screen winding and paying-out device for copying machines. 3,724,944, Cl. 355-18.000.

Sugiura, Akio: *See—*
Okamoto, Atsutoshi; and Sugiura, Akio, 3,724,903.

Suh, John T.: *See—*
Skorcz, Joseph A.; Suh, John T.; and Judd, Claude I., 3,725,426.

Sullivan, Donald P.: *See—*
Heeks, Robert E.; and Sullivan, Donald P., 3,725,073.

Sullivan, John Charles: *See—*
Jetzt, John J.; and Sullivan, John Charles, 3,725,601.

Sulzberger, Werner. Time-measuring device. 3,725,952, Cl. 346-82.000.

Sulzer Brothers Limited: *See—*
Pfarrwaller, Erwin, 3,724,513.

Sumitomo Chemical Company, Ltd.: *See—*
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.

Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.

Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.

Sumitomo Denki Kogyo Kabushiki Kaisha: *See—*
Honda, Sochiro; Hagiwara, Yoshitoshi; and Motoyoshi, Kenya, 3,725,048.

Sun Arrow Chemical Co., Ltd.: *See—*
Nakano, Satoshi; Azuma, Keiichi; Oba, Seiichiro; Wakizaka, Samon; and Nakamura, Sunichi, 3,725,507.

Sunbeam Corporation: *See—*
Mattson, Charles A., 3,724,186.

Sunbeam Plastics Corporation: *See—*
Gach, Peter P., 3,724,724.

Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., to Colgate-Palmolive Company. N-(2-hydroxyhydrocarbonyl) iminodicarboxylates. 3,725,473, Cl. 260-534.00e.

Sundholm, Norman K., to Uniroyal, Inc. Use of mixed polyamines formed by the acid-catalyzed condensation of an N-alkylaniline, 2-chloroaniline, and formaldehyde as curing agents for polyurethanes. 3,725,354, Cl. 260-75.0nh.

Sundstrand-Engelberg, Inc.: *See—*
Schaller, Robert L., 3,724,648.

Superscope, Inc.: *See—*
Zielke, Darrell W., 3,724,771.

Sure Lock Systems, Inc.: *See—*
Saltzstein, Julian I., 3,725,939.

Surel, Emile G. Talking book. 3,724,100, Cl. 35-35.00c.

Surwill, Michael: *See—*
Finkel, Abraham M.; and Surwill, Michael, 3,724,053.

Sussman, Alan, to RCA Corporation. Liquid crystal device with louver means located behind the liquid crystal device. 3,724,925, Cl. 350-160.01c.

Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, to Raion Yushi Kabushiki Kaisha. Pump for spraying. 3,724,726, Cl. 222-385.000.

Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Hirakawa, Michio, to Lion Fat & Oil Co., Ltd. Thermoplastic composition containing coprecipitated fillers and methods of making the fillers. 3,725,336, Cl. 260-41.00r.

Suter, Charles A., to Goodyear Tire & Rubber Company, The. Polyurethane container. 3,725,120, Cl. 117-104.00r.

Suyama, Fujio; Yamamoto, Tokuo; Shimono, Kenichi; Kuwahara, Hirosi; Ishii, Masao; and Watanabe, Ichiro, to Nitto Chemical Industry Co., Ltd. Paper making process comprising the incorporation of a polyacrylamide mucilaginous material. 3,725,195, Cl. 162-168000.

Suyderhoud, Henri George: *See—*
Campanella, Samuel Joseph; Suyderhoud, Henri George; and Onufry, Michael, Jr., 3,725,612.

Suzaki, Hideyuki: *See—*
Ichimori, Masuo; and Suzaki, Hideyuki, 3,724,001.

Suzuki, Hisao: *See—*
Kawamoto, Susumu; and Suzuki, Hisao, 3,725,212.

Suzuki, Kenji: *See—*
Watanabe, Kiyoshi; Shimada, Yoshio; Kawaharada, Hajime; Suzuki, Kenji; and Tanaka, Fumio, 3,725,200.

Suzuki, Minoru, to Ricoh Co., Ltd. Copy sheet feed tray raising and lowering device for duplicator or the like. 3,724,839, Cl. 271-39.000.

Suzuki, Seiya; Mizuhata, Yasuo; Kinoshita, Kunihiko; and Godo, Takanobu, to Toray Industries, Inc. Process for the preparation of lactams from cycloalkanone oximes. 3,725,391, Cl. 260-239.30a.

Suzuki, Shigemasa; and Nakamura, Kozo, to Nippon Ekiki Seikei Kibushiki Kaisha and Sanyo Pulp Kabushiki Kaisha. Method of preparing a porous synthetic thermoplastic film or sheet. 3,725,520, Cl. 264-41.000.

Svenska Aluctom AB: *See—*
Jonsson, Carldavid, 3,724,594.

Sweetheart Plastics, Inc.: *See—*
Davis, Paul, 3,724,710.

Swift, Harold E.: *See—*
Kobylinski, Tadeusz P.; and Swift, Harold E., 3,725,496.

Switching device for delivering sheet-like articles: *See—*
Katagiri, Takeo; Hiromori, Kunio; Yoshimura, Shoichiro; Suda, Kazuyoshi; and Tanaka, Jinichi, 3,724,657.

Sybron Corporation: *See—*
Battaglini, Domenic; Beach, Richard G.; and Raquith, Howard R., 3,724,275.

Sygnator, Henry A., to Illinois Tool Works Inc. Extruding screw. 3,724,315, Cl. 85-47.000.

Sylvania Electric Products Inc.: *See—*
McDonough, Thomas B., 3,725,155.

Symons Corporation: *See—*
Shoemaker, James C., 3,724,806.

Synectron, Inc.: *See—*
Fairchild, Anthony Prince, 3,725,865.

Szatmari, Franz; and Wernli, Max, to Fisher, George, Aktiengesellschaft. Apparatus for automatic regulation of the moisture content of granular material. 3,724,821, Cl. 259-149.000.

T. O. Plastics, Inc.: *See—*
Engler, Joseph P.; and Paulsen, Glen E., 3,724,719.

Taber, Robert C.: *See—*
Webster, Frank G.; and Taber, Robert C., 3,725,398.

Taborne, Michael T. Planter. 3,724,128, Cl. 47-33.000.

Tachimoto, Kazuo: *See—*
Morisaki, Toshikazu; and Tachimoto, Kazuo, 3,725,044.

Tadataka, Narumi: *See—*
Shiomi, Masano; and Tadataka, Narumi, 3,724,603.

Tahitian Products Co., Inc.: *See—*
Horner, Robert D., 3,725,086.

Takahashi, Makoto; and Hashimoto, Takao, to Yashica Company, Ltd. Discrimination circuit of physical quantities. 3,724,955, Cl. 356-227.000.

Takeda Chemical Industries, Ltd.: *See—*
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Yamazaki, Osami; and Fukudi, Hideo, 3,725,474.

Takeda, Hisami: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.

Takeda, Masao; Iida, Eiichi; Komatsubara, Tsuneo; and Kagoshima, Yutaka, to Japanese Geon Company, Ltd., The. Granulated viny chloride resin material. 3,725,325, Cl. 260-29.10r.

Takenaka, George, to Addmaster Corporation. Tape punch. 3,724,309, Cl. 83-575.000.

Takimoto, Masaaki: *See—*
Honjo, Satoru; Matsumoto, Seiji; and Takimoto, Masaaki, 3,724,941.

Talamantez, Rudolph. Cart with automatic positioning handle and independently positionable wheels. 3,724,863, Cl. 280-5.200.

Talmo, Robert Eugene, to International Telephone and Telegraph Corporation. Pulse generator. 3,725,665, Cl. 250-205.000.

Tamate, Tokutaro; Habuchi, Hirokazu; and Hirayama, Tsutomu, to Yokogawa Electric Works, Limited. Concentration measuring apparatus. 3,724,957, Cl. 356-116.000.

Tanaka, Fumio: *See—*
Watanabe, Kiyoshi; Shimada, Yoshio; Kawaharada, Hajime; Suzuki, Kenji; and Tanaka, Fumio, 3,725,200.

Tanaka, Hideki: *See—*
Satoh, Susumu; Tanaka, Hideki; Ono, Shujiro; and Horiguchi, Hiroshi, 3,725,049.

Tanaka, Jinichi: *See—*
Katagiri, Takeo; Hiromori, Kunio; Yoshimura, Shoichiro; Suda, Kazuyoshi; and Tanaka, Jinichi, 3,724,657.

Tanaka, Katsutoshi: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.

Tanaka, Yutaka, to Matsushita Electric Industrial Co., Ltd. Amplitude quantized signal transmission method. 3,725,592, Cl. 179-15.55r.

Tanasawa, Yasusi; Inoue, Tokuta; and Ishiguro, Kenji, to Nippondenso Co., Ltd., Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho. Exhaust gas purifying device for internal combustion engines. 3,724,220, Cl. 60-303.000.

Tanimoto, Kenji: *See—*
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.

Tarkan, Stuart E.: *See—*
Mal, M. Kumar; and Tarkan, Stuart E., 3,725,016.

Tarshis, Lemuel A.; and Walker, James L., to General Electric Company. Grain size of metal castings. 3,725,057, Cl. 75-170.000.

Tassoney, Joseph P.; and Dille, Roger M., to Texaco Inc. Pollution abatement process for refinery waste water. 3,725,270, Cl. 210-63.000.

Tate, Jack F., to Texaco Inc. Secondary recovery method. 3,724,544, Cl. 166-271.000.

Tate, John E., to American Air Filter Company, Inc. Fluid treating filter. 3,724,671, Cl. 210-484.000.

Tatsukawa, Keizo: *See—*
Fujimoto, Yasuo; Masumura, Isao; Tatsukawa, Keizo; Koshimoto, Shinsuke; and Doiuchi, Toru, 3,725,353.

Tatum, Joe F. Deep anode bed for cathodic protection. 3,725,669, Cl. 307-95.000.

Taylor, George William: *See—*
Braun, Edwin Julius; Meise, Henry August, Jr.; and Taylor, George William, 3,725,598.

Taylor, Robert S. Self-contained gooseneck dumping trailer. 3,724,695, Cl. 214-505.000.

Taylor, Wilbur S.: *See—*

Stearns, Milo E.; and Taylor, Wilbur S., 3,725,327.
Tazuke, Yasuhiko: *See—*
Sugimori, Tsunetake; Tsukada, Yoji; and Tazuke, Yasuhiko, 3,725,201.
T.D.K. Electronics Company, Ltd.: *See—*
Miura, Taro; Nakamura, Kiichi; and Hashimoto, Tadashi, 3,725,823.
Te Velde, Harm Frank, to U.S. Philips Corporation. Overhead conveyor. 3,724,391, Cl. 104-172.500.
Technigaz: *See—*
Alleaume, Jean H., 3,724,411.
Technology Service Corporation: *See—*
Brennan, Lawrence E.; and Reed, Irving S., 3,725,922.
Tecotzky, Melvin: *See—*
Buchanan, Robert A.; Tecotzky, Melvin; and Wickersheim, Kenneth A., 3,725,704.
Teijin Limited: *See—*
Nagahama, Shizuo; Shimada, Keizo; and Kurozumi, Seizi, 3,725,490.
Tektronix, Inc.: *See—*
Kellogg, James R., 3,725,792.
Vollum, Charles Howard, 3,725,724.
Telefonaktiebolaget L M Ericsson: *See—*
Holmgren, Nils Erik Borje, 3,725,925.
Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
Schreiber, Olaf, 3,725,937.
Temes, Gabor C., to Collins Radio Company. Asymmetrical loss-pole mechanical filter. 3,725,828, Cl. 333-71.000.
Tenneco Inc.: *See—*
Malkiewicz, Wladyslaw F., 3,724,591.
Teplyakov, Sergei Dmitrievich: *See—*
Lyass, Abram Moiseevich; Snulova, Lidia Dorofeevna; Borsuk, Pavel Afanasievich; Tsyruleva, Anna Ivanovna; and Teplyakov, Sergei Dmitrievich, 3,725,090.
Teradyne, Inc.: *See—*
Johnson, Lennart B., 3,725,843.
Terayama, Mutsuo: *See—*
Yamamoto, Kenji; Sasaki, Nobuharu; and Terayama, Mutsuo, 3,725,416.
Terra, Karl Romanovich: *See—*
Leliovsky, Anton Felixovich; Ryabinin, Vladimir Alexandrovich; Terra, Karl Romanovich; and Yankevich, Kira Boleslavovna, 3,725,717.
Terrell, Harold. Tandem axle traction equalizer. 3,724,581, Cl. 180-24.120.
Texaco Inc.: *See—*
Goldsby, Arthur R., 3,725,499.
Patmore, Edwin L.; Siegart, William R.; and Chafetz, Harry, 3,725,468.
Pitts, Robert William, Jr., 3,725,857.
Rundell, Herbert A.; and Pittman, Robert W., 3,724,558.
Shimely, Jesse H.; and Archer, Edward D., 3,725,302.
Slater, William L.; and Ahlborn, John C., 3,725,020.
Tassoney, Joseph P.; and Dille, Roger M., 3,725,270.
Tate, Jack F., 3,724,544.
Wilson, Raymond F.; Peck, Reese A.; Carter, Norman D.; Cole, Edward L.; and Hess, Howard V., 3,725,250.
Woodle, Robert A., 3,725,245.
Texas Instruments, Incorporated: *See—*
Balir, Charles M.; and Huband, Frank L., 3,725,859.
Bean, Kenneth E.; and Yeakley, Richard L., 3,725,160.
Boulanger, Henry J., 3,725,907.
Canion, Joseph R., 3,725,898.
Carbajal, Bernard G., III; Gosney, William Milton; and Hall, Lou H., 3,724,065.
Choate, William C.; and Masten, Michael K., 3,725,875.
Merkel, Ronald F., 3,725,662.
Morgan, Ian H., 3,725,136.
Pierce, Joe T., 3,725,213.
Sadler, Porter, 3,725,711.
Scott, Warner C., 3,725,812.
Textron, Inc.: *See—*
Erickson, Albin R., 3,724,578.
Hudnall, Frederick W., 3,724,150.
Mason, Richard K., 3,724,330.
Thakore, Kaushik H., to Bendix Corporation, The. Voltage regulated transistorized ignition system for an automobile turbine engine. 3,725,732, Cl. 315-209.00t.
Thal, Heinz, to Ludwig Taprogge. Screen installation. 3,724,669, Cl. 210-409.000.
Thalenfeld, David R. Apertured panel hook and method for manufacture. 3,724,792, Cl. 248-223.000.
Thayer, Helen I.: *See—*
Deffner, John F.; Tucci, Edmond R.; Thayer, Helen I.; and Ward, John V., 3,725,483.
Thermo-Electronics, Inc.: *See—*
Ehrens, Henry; and Slocum, Charles W., 3,725,757.
Thibault, Claude: *See—*
Donche, Alain; Thibault, Claude; Arretz, Emmanuel; and Pfister, Alain, 3,725,394.
Thilenius, Thilo: *See—*
Kuhne, Rudolf; Hamal, Heinrich; and Thilenius, Thilo, 3,725,101.
Thiokol Chemical Corporation: *See—*
Mayes, Nathan; Green, Joseph E.; and Michaels, Ronald, 3,725,374.
McDonald, Allan J., 3,724,217.
Villa, Jose L., 3,725,337.
Thom, Karl F., to Minnesota Mining and Manufacturing Company. Opening rare earth ores with perfluoroalkanesulfonic acids. 3,725,296, Cl. 252-301.10r.
Thomas, Michael W., to Westinghouse Electric Corporation. Transformer tap selector. 3,725,833, Cl. 336-140.000.
Thomas, Richard H.: *See—*
Marschke, Carl R.; and Thomas, Richard H., 3,724,687.
Thompson, Earl Clayton. Water distribution system for poultry and small animals. 3,724,425, Cl. 119-72.000.
Thompson, Gene C.; Radomski, Joseph W.; and Wilson, David E., to Southworth Machine Company. Sheet winding, turning and aligning method and apparatus. 3,724,089, Cl. 34-23.000.
Thompson, John T.: *See—*
Gillemot, George W.; and Thompson, John T., 3,725,581.
Thompson, John T.; and Gillemot, George W. Protective cable splice assembly and method. 3,725,580, Cl. 174-38.000.
Thompson, Kenneth C., to Electronic Processors, Inc. Rotating magnetic tape head having air cushion support for the tape. 3,725,606, Cl. 179-100.20p.
Thompson, Tommy Lewis, to Life Support, Inc. Ignition composition initiated by water. 3,725,156, Cl. 149-81.000.
Thomson-CSF: *See—*
Lebourg, Pierre, 3,725,609.
Thorn, John E.; and Selman, Alan A., to Ford Motor Company. Hydraulic load indicating device. 3,724,571, Cl. 177-141.000.
Thornton, Brian, to Birkett, Samuel, Limited. Valve actuating means. 3,724,753, Cl. 236-92.00c.
Thrash, David J.: *See—*
Fekete, Frank; Pulman, Leonard J.; and Thrash, David J., 3,725,172.
Thrower, Arthur J.; and Hotchkiss, Marvin E., to Goodrich, B. F., Company, The. Segmented friction member assembly for brake or clutch. 3,724,623, Cl. 192-107.00r.
Thuron Industries, Inc.: *See—*
Grubb, Larry M., 3,725,311.
Thut, Bruno H., to Carborundum Company, The. Swivel joint assembly. 3,724,877, Cl. 285-55.000.
Thvedt, Krane: *See—*
Kasin, Hans; and Thvedt, Krane, 3,724,587.
Thyberg, Paul D.; and Splettstoeszer, Wallace G., to General Housewares Corporation. Webbed panel for chairs. 3,724,402, Cl. 110-371.000.
Tibbott, David W., to Ingersoll-Rand Company. Automatic throttle shut-off power tool. 3,724,560, Cl. 173-12.000.
Tiblin, Bert V.: *See—*
Fleischer, Herman J.; Lipsky, Philip; and Tiblin, Bert V., 3,725,918.
Till, Henry R., to Xerox Corporation. Wiper blade cleaner for xerographic machines. 3,724,020, Cl. 15-256.530.
Tillmann, Horst, to Dorken & Mankel KG. Automatic door closer. 3,724,023, Cl. 16-53.000.
Tilp, George E., to Adams Industries. Electric cup heater. 3,725,641, Cl. 219-433.000.
Tindle, Roger C.: *See—*
Stalling, David L.; and Tindle, Roger C., 3,725,260.
Tischler, Ludwig J.: *See—*
Olsen, Harry C.; Tischler, Ludwig J.; and Wernecke, Heinz C., 3,724,730.
Olsen, Harry C.; Tischler, Ludwig J.; and Wernecke, Heinz C., 3,724,928.
Titlar, James M.: *See—*
Quirk, Virgil P.; and Titlar, James M., 3,725,718.
Titus, Charles H.: *See—*
Bell, Christy W.; and Titus, Charles H., 3,724,543.
T.M.M. (Research) Limited: *See—*
Greenwood, Robert; and Shepherd, John Michael, 3,724,194.
Hopper, Norbert; and Gurnshaw, Terence, 3,724,191.
Nicholson, Bruce; and Mitchell, James, 3,724,037.
Scowcroft, Hector, 3,724,197.
Toitsu Kogyo Kabushiki Kaisha: *See—*
Otsuka, Kozo, 3,725,854.
Tokarz, Henry J., to Harris-Intertype Corporation. Back guage position control for a paper cutting machine. 3,725,763, Cl. 318-600.000.
Tokuyama Soda Kabushiki Kaisha: *See—*
Nakano, Satoshi; Azuma, Keiichi; Oba, Seiichiro; Wakizaka, Samon; and Nakamura, Sunichi, 3,725,507.
Tokyo Shibaaura Electric Co., Ltd.: *See—*
Sawagata, Shinichi, 3,725,712.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Imamura, Hitoshi; and Katakura, Keiji, 3,724,740.
Tokyo Shibauri Electric Co., Ltd.: *See—*
Arai, Sakae, 3,725,627.
Tomcufcik, Andrew Stephen; Izzo, Patrick Thomas; and Fabio, Paul Frank, to American Cyanamid Company. 6-Substituted amino-3-nitroimidazo (1,2-B) pyridazines and methods of preparing the same. 3,725,407, Cl. 260-250.00a.
Tomlinson, Charles W., to Acme Visible Records, Inc. Document carrier envelope construction. 3,724,743, Cl. 229-55.000.
Tomlinson, Norfleet. Pollution-reducing fuel filter. 3,724,429, Cl. 123-25.00r.
Tonnessen, Tonnes K. Nonpolluting engine. 3,724,432, Cl. 123-74.00r.
Topfmeier, Fritz: *See—*

Stoeck, Georg; Budka, Heinz-Gunter; Topfmeier, Fritz; and Gradel, Wolf;Dietrich, 3,725,465.
Toray Industries, Inc.: *See—*
Suzuki, Seiya; Mizuhata, Yasuo; Kinoshita, Kunihiko; and Godo, Takanobu, 3,725,391.
Torii, Osamu: *See—*
Hashimoto, Yasuyuki; and Torii, Osamu, 3,724,960.
Toro Manufacturing Corporation: *See—*
Hunter, Edwin J., 3,724,487.
Toshimitsu, Tatsuo: *See—*
Yamada, Keisho; Nishimura, Kenji; Furusaki, Shinichi; Toshimitsu, Tatsuo; and Inaba, Yukio, 3,725,459.
Toth, Tibor Endre, to Union Carbide Corporation. AC-DC short circuit welding indicator. 3,725,636, Cl. 219-131.00r.
Touchy, Wolfgang, to Siemens Aktiengesellschaft. Method of producing oxygen poor gallium arsenide by using aluminum with silicon or germanium as a dopant. 3,725,284, Cl. 252-62.3ga.
Toyo Glass Company, Limited: *See—*
Hara, Takao, 3,724,639.
Toyoda Koki Kabushiki Kaisha: *See—*
Ishikawa, Mineo, 3,724,138.
Kobayashi, Akiyoshi, 3,724,331.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Shiomi, Masano; and Tadataka, Narumi, 3,724,603.
Tanasawa, Yasusi; Inoue, Tokuta; and Ishiguro, Kenji, 3,724,220.
Traber, Walter; and Weiss, Anton G., to Ciba-Geigy Corporation. Bactericidal compositions and method of killing bacteria using bis(phenoxyphenyl)carbonates. 3,725,555, Cl. 424-301.000.
Traise, Thornton P.; Watson, Roger W.; and Littel, Randel Q., to Standard Oil Company. Ashless oil additives. 3,725,480, Cl. 260-583.00p.
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Traver, Frank J., to General Electric Company. Polysiloxane composition useful as a brake fluid. 3,725,287, Cl. 252-78.000.
Treadwell Corporation: *See—*
Roberts, Edward S., 3,724,887.
Trechock, Jack: *See—*
Zanpirri, Anthony P.; Trechock, Jack; and Joseph, Robert T., 3,725,019.
Treff, Ernest H., to Harris-Intertype Corporation. Harmonic drive register adjustment device for a printing press. 3,724,368, Cl. 101-248.000.
Trent, Lewis C.: *See—*
Jacoby, Frederick J.; Hamb, Frederick L.; and Trent, Lewis C., 3,725,329.
Trepka, William J.; and Sonnenfeld, Richard J., to Phillips Petroleum Company. Polymerization process employing a polymerization initiator formed on admixing a vinyltin compound and a haloarylllithium compound. 3,725,376, Cl. 260-94.300.
Triax Company, The: *See—*
Atwater, Wayne G., 3,724,688.
Tribit, Samuel: *See—*
Nozik, Arthur Jack; Tribit, Samuel; and Williams, Ferd E., 3,725,099.
Trident Engineering Associates, Inc.: *See—*
Jasperson, Robert E.; and Kapland, Mitchell Arthur, 3,724,079.
Tripp, Robert W., to Inductosyn Corporation. Machine tool contour control system. 3,725,654, Cl. 235-151.110.
Trisoglio, Giovanni: *See—*
de Nora, Vittorio; and Trisoglio, Giovanni, 3,725,223.
Troscinski, Edwin S.; and Stanford, James R., to Nalco Chemical Company. Secondary recovery of petroleum. 3,724,551, Cl. 166-295.000.
Trout, Robert G.; and Stalego, Charles J., to Owens-Corning Fiberglas Corporation. Method of producing glass fibers. 3,725,021, Cl. 65-3.000.
Tru-Pitch, Inc.: *See—*
Halstead, Earle W., 3,724,437.
TRW Inc.: *See—*
Stanley, Charles C.; and Kropp, John L., 3,725,658.
Tsai, James Hwa-San: *See—*
Rogers, Morris Gwynne; and Tsai, James Hwa-San, 3,725,341.
Tsubouchi, Hideo: *See—*
Matsui, Kazuma; and Tsubouchi, Hideo, 3,724,504.
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, to Sumitomo Chemical Company, Ltd. O-aryl O-alkyl S-organo phosphrothidates. 3,725,514, Cl. 260-964.000.
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Tsuda, Momotoshi: *See—*
Yoshida, Makoto; Tsuda, Momotoshi; Oishi, Yasushi; and Nakazyo, Kiyoshi, 3,725,072.
Tsukada, Yoji: *See—*
Sugimori, Tsunetake; Tsukada, Yoji; and Tazuke, Yasuhiko, 3,725,201.
Tsyruleva, Anna Ivanovna: *See—*
Lyass, Abram Moiseevich; Snulova, Lidia Dorofeevna; Borsuk, Pavel Afanasievich; Tsyruleva, Anna Ivanovna; and Teplyakov, Sergei Dmitrievich, 3,725,090.
Tucci, Edmond R.: *See—*
Deffner, John F.; Tucci, Edmond R.; Thayer, Helen I.; and Ward, John V., 3,725,483.
Tucker, Cathern A. Reinforced trouser pocket. 3,723,994, Cl. 2-248.000.
Tudor Metal Products Corporation: *See—*
Payne, Calvin L., Jr., 3,724,852.
Tufte, Obert N.: *See—*
Hager, Robert J.; Hitchell, Maurice L.; and Tufte, Obert N., 3,725,135.
Tunzi, Burton R. Monolithic analog-to-digital converter. 3,725,905, Cl. 340-347.0ad.
Turman, Bobby N., to United States of America, Air Force. Particle density control system for colloid cor nuclear reactor. 3,724,484, Cl. 137-110.000.
Turner, Robert: *See—*
Blakeley, Ronald Edward; and Turner, Robert, 3,724,259.
Turner, Wilson R., to Hewlett-Packard Company. Multipole mass filter with artifact-reducing electrode structure. 3,725,700, Cl. 250-41.9ds.
Turnock, Philip H.; Bancroft, William G.; and Lee, Max N. Y., to Union Carbide Corporation. Regeneration of molecular sieves having sulfur compounds adsorbed thereon. 3,725,299, Cl. 252-411.00s.
Tuschhoff, John V.: *See—*
Hanson, Cleo E.; and Tuschhoff, John V., 3,725,386.
Tygard, Charles M.; and Cameron, James H., to Spectrol Electronics Corporation. Method of assembling a switch by the use of an aligning pin. 3,724,067, Cl. 29-622.000.
Tymann, Edward B.: *See—*
Huettner, Robert E.; Tymann, Edward B.; and Nolin, Richard, 3,725,871.
Ube Industries, Ltd.: *See—*
Yamada, Keisho; Nishimura, Kenji; Furusaki, Shinichi; Toshimitsu, Tatsuo; and Inaba, Yukio, 3,725,459.
Uchida, Kenji: *See—*
Gomes, John M.; Uchida, Kenji; and Wong, Morton M., 3,725,221.
Uchytil, Gary, to Micro Science Associates. Filler masking of small apertures. 3,725,215, Cl. 204-15.000.
Ueda, Yasuo: *See—*
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,725,066.
Uelzmann, Heinz; and Hidinger, David C., Jr., to General Tire & Rubber Company, The. Reaction products of multiaziridino compounds and hydrogen sulfide. 3,725,460, Cl. 260-470.000.
Ugine Kuhlmann: *See—*
Borrel, Marcel; Marion, Jacques; and Metzger, Jean, 3,725,457.
Uhing, Eugene H., to Stauffer Chemical Company. Process for the preparation of phosphorus compounds having an alkyl ether substituent and intermediates therefor. 3,725,466, Cl. 260-502.40r.
Ukita, Keizo; and Sadamori, Toshimasa, to Japanese Geon Company Ltd., The. Process for the preparation of liquid polybutadiene. 3,725,492, Cl. 260-680.00b.
Ukmar, Milosh L., to Allen Electric and Equipment Company, mesne. Vehicle-mounted antenna and coupling circuit therefor. 3,725,942, Cl. 343-715.000.
Ullrich, Martin: *See—*
Erdmenger, Rudolf; Ullrich, Martin; Germerdonk, Rolf; Pedain, Josef; Quiring, Bernd; and Wingler, Frank, 3,725,340.
Ulrich, Reinhard; and Weber, Heinz Paul, to Bell Telephone Laboratories, Incorporated. Dielectric ring lasers using waveguiding. 3,725,809, Cl. 331-94.500.
Unarco Industries, Inc.: *See—*
Enochian, Samuel H., 3,724,395.
Underwriters Safety Device Company: *See—*
Linn, Richard L., 3,725,851.
Unger, Edward H.: *See—*
Allen, Paul T.; Drinkard, B. M.; and Unger, Edward H., 3,724,170.
Unger, Hans Peter Olof; Westberg, Eric J. H.; and Schwartz, Stephan L., to AGA Aktiebolag. Centrifuge apparatus with means for moving material. 3,724,747, Cl. 233-3.000.
Unger, Paul N. Cardiac warning device. 3,724,455, Cl. 128-2.06a.
Union Carbide Canada Limited: *See—*
Lauge, Raitis; and Hart, Edward Raymond, 3,724,978.
Union Carbide Corporation: *See—*
Chadwick, Cecil George, 3,725,051.
Keig, George A.; Smith, James C.; and Watts, John M. J., 3,725,092.
Koleske, Joseph Victor; Roberts, Rene Marie-Joseph; and Del Giudice, Frank Paul, 3,725,352.
Montgomery, Lionel C., 3,724,996.
Senderoff, Seymour, 3,725,128.
Toth, Tibor Endre, 3,725,636.
Turnock, Philip H.; Bancroft, William G.; and Lee, Max N. Y., 3,725,299.
Wang, Jui Chung, 3,725,254.
Union Oil Company of California: *See—*
Hass, Robert H.; Mickelson, Grant A.; Baral, William J.; Reeg, Cloyd P.; Attane, Edward C., Jr.; and Jones, Darryl L., 3,725,243.
Uniroyal, Inc.: *See—*

Sundholm, Norman K., 3,725,354.
Uniroyal Ltd., mesne: *See—*
Harrison, William A.; and Kulka, Marshall, 3,725,427.
United Aircraft Corporation: *See—*
Adams, Don L.; and Cotton, Louis S., 3,724,786.
Erickson, John S.; Curran, Patrick M.; and Owczarski, William A., 3,724,531.
Mann, George, 3,725,722.
Waehner, Glenn C., 3,725,727.
West, Roger Frankland, 3,725,726.
United Industrial Syndicate, Inc.: *See—*
Bishop, Peter, 3,725,736.
United Kingdom Atomic Energy Authority: *See—*
Guneratne, Piyatilleke Perera, 3,725,847.
Stephenson, John, 3,724,658.
Woodhead, James Louis; Dell, Ronald Michael; Junkinson, Anthony Richard; and Wilkinson, Raymond Westrop, 3,725,298.
United States Manufacturing Company: *See—*
Kolman, John L., 3,723,997.
United States of America
Agriculture: *See—*
Bowers, William S., 3,725,551.
Calamari, Timothy A., Jr.; Schreiber, Sidney P.; Cooper, Albert S., Jr.; and Reeves, Wilson A., 3,724,243.
Friedman, Mendel, 3,725,261.
Hunter, Irving R.; and Walden, Mayo K., 3,725,425.
Lanoux, Sigred B.; Elizey, Samuel E., Jr.; Drake, George L., Jr.; and Reeves, Wilson A., 3,725,001.
Marvel, Carl S.; and Chow, Roberta C. L., 3,725,442.
Schwimmer, Sigmund, 3,725,085.
Air Force: *See—*
Ares, Manuel, 3,725,926.
Bilow, Norman; and Rosenberg, Harold, 3,725,175.
Campbell, William S.; and von Ohain, Hans J. P., 3,724,784.
Christian, John B., 3,725,273.
Davis, Dale M., 3,724,379.
Duesberg, Joe D., 3,724,048.
Farmer, William M., 3,724,930.
Fiedler, William S., 3,725,927.
Hartley, Jack G., 3,724,495.
Lawson, Maurice O.; and Willke, Theodore L., 3,725,737.
Mansell, Dennis N., 3,725,816.
Morrissey, James P.; and Mac Donald, Donald J., 3,724,271.
Petry, Gene A.; and Reagan, Michael H., 3,724,788.
Roehl, Ernest R.; and Carey, Gerald D., 3,725,913.
Ruzzo, Joseph G., Jr., 3,725,129.
Schlossberg, Howard, 3,725,814.
Schmidt, Donald L., 3,724,386.
Simons, John C., 3,724,817.
Sletten, Carlyle J.; Schell, Allan C.; Mack, Richard B.; Goggins, William B., Jr.; and Blacksmith, Philipp, 3,725,917.
Slobodnik, Andrew J., Jr., 3,725,827.
Turman, Bobby N., 3,724,484.
Walton, Roger H., 3,724,814.
Webster, Jonathan C.; Sloan, Earl L., III; and Ganssen, Alexander, 3,725,798.
Wiedeman, Robert A.; and Hillesland, Harold L., 3,725,564.
Wolverton, Billy C., 3,725,269.
Army, mesne: *See—*
McDermott, Michael S.; and Pederson, Carl A., 3,725,729.
Atomic Energy Commission: *See—*
Brunson, Glenn S.; Curran, Robert N.; and Just, Franklin H., 3,725,688.
Culley, John C., 3,725,659.
Deaton, Ronald L.; and Silver, Gary L., 3,725,294.
Eckelman, William C.; and Richards, Powell, 3,725,295.
Gripentog, William G., 3,725,661.
Haas, Paul A., 3,725,293.
Neudecker, Joseph W.; and Cooper, Kenneth C., 3,724,215.
Siple, Ralph J., 3,725,940.
Interior: *See—*
Gelblum, P. Gideon, 3,725,267.
Gelblum, P. Gideon, 3,725,268.
Mintz, Milton S., 3,725,235.
Stalling, David L.; and Tindle, Roger C., 3,725,260.
Navy: *See—*
Alpers, Frederick C., 3,725,935.
Beatty, Bobby D.; Butts, Gary D.; Herold, Stanley J.; and La Grange, Donald E., 3,724,385.
Becke, Edward G., 3,725,849.
Berta, Dominic A., 3,725,157.
Buchholz, Donald E.; Bakala, Ronald L.; Miller, Robert E.; and Pickering, Richard W., 3,725,912.
Calkins, Burton H.; Carstens, Dale L.; and Riester, James J., 3,724,375.
Chervenak, John, 3,725,856.
Crawford, Jack A.; Lewis, George R.; and Woodworth, William H., 3,725,576.
Donahue, William J., 3,724,384.
Easton, Roger L., 3,725,924.
Gauzza, Harry J.; and Horanoff, Eugene V., 3,724,782.
Johnson, Clarence S.; and Langguth, Arthur F., 3,725,173.
Kaufman, Martin H., 3,725,516.
Kautz, William H., 3,725,689.
Keister, Frank Z.; and Rust, John B., 3,725,671.
Lagally, Paul; and Nagy, Robert P., 3,724,919.
Loyk, Victor, 3,725,758.
McCulloch, Charles R.; Moy, Bertram K.; and Randle, Thomas C., 3,725,154.
Mohon, Windell N.; and Rodemann, Alfred N., 3,724,933.
Moody, Paul E., 3,724,600.
Moore, Robert P., 3,725,931.
Murphree, Francis J.; Kennedy, Peter D.; and Webster, Richard B., 3,725,855.
Nolan, William J., Jr.; and Alpers, Frederick C., 3,724,783.
Plizak, Bruno T., 3,725,566.
Reed, Richard E., 3,724,322.
Rubin, David; and Seybold, John B., 3,725,682.
Sherman, Robert P., 3,725,936.
Smith, E. Quimby, Jr., 3,724,216.
Somerville, James; Smith, Donald F.; and Yaccarino, Joseph N., 3,724,374.
Zabelka, Richard J.; and Smith, Lloyd H., 3,724,319.
Navy, mesne: *See—*
Gallaghan, John A.; Benson, Ronald W.; and Carlson, Bertil V., 3,724,383.
Mack, Michael E.; and Mongeon, Robert J., 3,725,733.
Phillips, Ralph O., 3,724,372.
Woodward, Oakley McDonald, 3,725,824.
United States Steel Corporation: *See—*
Alworth, Harry M.; and Kalin, Sumner H., 3,725,143.
Douty, Donald L., 3,724,728.
Johns, William H., 3,724,527.
Patula, Edward J.; Roberts, William L.; and Somers, Robert R., 3,725,140.
Secrist, Walter S., 3,724,496.
Unitek Corporation: *See—*
Preston, Leonard A.; and Shriver, Seymour J., 3,724,077.
Universal Instruments Corporation: *See—*
Holmes, Robert H.; and Zemek, Albert W., 3,724,055.
Universal Oil Products Company: *See—*
Auriemma, Nicholas A., 3,724,715.
Greenwood, Arthur Raymond; and Vesely, Kenneth Donald, 3,725,248.
Maiear, William H., 3,725,252.
Urban, Peter; and Albert, David J., 3,725,303.
Vesely, Kenneth Donald; and Greenwood, Arthur Raymond, 3,725,249.
Universal Research Laboratories, Incorporated: *See—*
Olliges, William E.; Polanek, Edward L.; and Gurney, Robert, 3,725,759.
University of California, The Regents of the: *See—*
Bose, Elaine A.; and White, Earl R., 3,725,406.
University of Strathclyde: *See—*
Wood, Hamish C. S.; and Stuart, Alexander, 3,725,408.
Upjohn Company, The: *See—*
Beal, Philip F.; and Shephard, Kenneth P., 3,725,392.
Beal, Philip F., III; and Pike, John E., 3,725,454.
Nelson, John W., 3,725,469.
Rynbrandt, Ronald H., 3,725,423.
Urban, Peter; and Albert, David J., to Universal Oil Products Company. Bimetallic catalyst for use in reducing-oxysulfur compounds. 3,725,303, Cl. 252-439.000.
Urbanosky, Harold J.; and Whitten, Frank R., to Schlumberger Technology Corporation. Apparatus for disengaging well tools from borehole walls. 3,724,540, Cl. 166-100.000.
U.S. Philips Corporation: *See—*
Albinger, Walter; and Heitzer, Karl, 3,725,164.
Reinhoudt, Jacobus Pieter, 3,724,918.
Schroder, Johann; and Van Witteveen, Roland Anton Johan Otto, 3,725,153.
Skoyles, Derek Robert, 3,724,914.
Stevens, Simon, 3,724,005.
Te Velde, Harm Frank, 3,724,391.
Van Heel, Jean J. Marie D., 3,725,874.
U.S. Philips Corporation, mesne: *See—*
De Gier, Johannes; and Eisses, Reinhart Charles Willem, 3,725,710.
Ustach, Gerald S., to Hughes Aircraft Company. Polyphasor generation by vector addition and scalar multiplication. 3,725,686, Cl. 235-156.000.
Ute Linter, Inc.: *See—*
Burton, Maurice G., 3,724,290.
Vac-O-Cast: *See—*
Schmitz, William L., 3,724,076.
Vail, Edward O. Rotatable hygienic vaginal swab device. 3,724,463, Cl. 128-269.000.
Valdo, Alex R.: *See—*
Berry, Currie B., Jr.; and Valdo, Alex R., 3,725,037.
Valeriote, Michael Archibald, Jr. Free standing fiberglass antenna. 3,725,944, Cl. 343-873.000.
Van Benschoten, Peter J.: *See—*
Naive, Joel A.; and Van Benschoten, Peter J., 3,725,782.
van der Grinten, Willem J., to General Electric Company. Composite membrane useful in noninvasive sensor for gases and vapors. 3,724,175, Cl. 55-158.000.
Van Der Meer, Leonardus Petrus, to N.V. Leidsche Apparatenfabriek. Closure spindle. 3,724,166, Cl. 53-334.000.
van Dyk, John C.: *See—*

Freshour, Kenneth D.; and van Dyk, John C., 3,724,762.
Van Heel, Jean J. Marie D., to U.S. Philips Corporation. Segment addressing. 3,725,874, Cl. 340-172.500.
Van Patten, Charles A. Language teaching device. 3,724,102, Cl. 35-35.00h.
Van Peppen, Jan F.: *See*—
Fuhrmann, Robert; and Van Peppen, Jan F., 3,725,489.
Van Witteveen, Roland Anton Johan Otto: *See*—
Schroder, Johann; and Van Witteveen, Roland Anton Johan Otto, 3,725,153.
Vanderbilt, R. T., Company, Inc.: *See*—
Stearns, Milo E.; and Taylor, Wilbur S., 3,725,327.
Vandervell Products Limited: *See*—
Sims, Arthur Albert; and Sharp, Stanley Gordon, 3,724,257.
Vanguard U.S.: *See*—
Stabile, Lucio, 3,725,755.
Vapor Corporation: *See*—
Roth, Carl W., 3,724,396.
Varian Associates: *See*—
Anderson, Norman C., 3,725,714.
Levin, Martin E., 3,725,721.
Nelson, Forrest A., 3,725,773.
Seldon, Martin M.; and Garbini, Leo J., 3,725,719.
Varichon, Claude, to Compagnie Generale d'Electricite. Vehicle guidance system. 3,724,584, Cl. 180-79.000.
Varner, Donald E., to Industrial Nucleonics Corporation. Process control system. 3,724,468, Cl. 131-21.00d.
Varnum, Gordon D.; and Meylan, Charles D., said Meylan assor. to Carver, Fred S. Apparatus and method for the vibratory feeding of pulverulent and granular materials. 3,724,819, Cl. 259-29.000.
Varona, Paulino G. Portable fire pot for soldering iron. 3,724,444, Cl. 126-237.000.
Veb Elektrogeratewerk Suhl: *See*—
Friedel, Christian; and Faethe, Manfred, 3,725,218.
VEB Jenapharm: *See*—
Kral, Erwin F.; and Eschrich, Dieter, 3,725,007.
Vecellio, Bernardino; and Casa, Fausto, to Industrie Pirelli, S.p.A. Process for bonding artificial or synthetic textile fibers to rubber. 3,725,177, Cl. 156-333.000.
Veeder Industries Inc.: *See*—
Finnegan, Ronald A., 3,725,902.
Velten, Edmund M.; Jagaciak, George J.; Wambold, John N.; and Epstein, Arthur, to Beryllium Corporation, The. Method of making beryllium shapes from powder metal. 3,724,050, Cl. 29-182.000.
Veneria, Giovanni Bessolo, to Olivetti, Ing., C., & C., S.p.A. Plastics moulding presses. 3,724,802, Cl. 249-67.000.
Ventura, Fernando Fernandez: *See*—
Streich, Federico; Gold, Alberto Vargas; Oliversas, Jose Ma Bonastre; and Ventura, Fernando Fernandez, 3,724,311.
Verdone, Michael A.: *See*—
Francini, Joseph P.; and Verdone, Michael A., 3,724,652.
Verdone, Michael A., to Singer Company, The. Door control mechanism. 3,724,134, Cl. 49-379.000.
Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft: *See*—
Hager, Ahois, 3,725,042.
Verhille, Karel; and Conix, Andre Jan, to Agfa-Gevaert N.V. Method of producing and using a photoconductive recording medium. 3,725,061, Cl. 96-1.800.
Vermeulen, Emile R., to Sidaplax. Closuring containers. 3,724,161, Cl. 53-42.000.
Vermont American Corporation: *See*—
McCord, Wilfred M., Jr., 3,724,519.
Verstegen, Willi, to International Standard Electric Corporation. Arrangement for TDM telecommunication between PCM switching networks. 3,725,590, Cl. 179-15.0bs.
Vesely, Kenneth Donald: *See*—
Greenwood, Arthur Raymond; and Vesely, Kenneth Donald, 3,725,248.
Vesely, Kenneth Donald; and Greenwood, Arthur Raymond, to Universal Oil Products Company. Continuous reforming-regeneration process. 3,725,249, Cl. 208-139.000.
Vetrocoke Cokapuania S.p.A., mesne: *See*—
Giammarco, Guiseppe; and Giammarco, Paolo, 3,725,529.
Viallet, Andre: *See*—
Smith, Leon; Calvert, David W.; Robert, Andre; Viallet, Andre; and Pauw, Daniel R., 3,725,194.
Vickers, Robert V., to Park-Ohio Industries, Inc. Slab heating device. 3,725,629, Cl. 219-10.790.
Viennot, Pierre, to Societe Anonyme: Produits Chimiques Ugine Kuhlmann. Article comprising polytetrafluoroethylene and process for making same. 3,725,187, Cl. 161-111.000.
Vilenski, Dan: *See*—
Angelucci, Thomas L.; Angelucci, Joseph L.; and Vilenski, Dan, 3,725,631.
Villa, Jose L., to Thiokol Chemical Corporation. Process of stabilizing polyethplene sulfide. 3,725,337, Cl. 260-45.80r.
Villeroy & Boch S.A.: *See*—
Maringer, Robert; and Cordelle, Claude, 3,724,979.
Vilter Manufacturing Corporation: *See*—
Grant, Whitney I., 3,724,231.
Vishnevsky, Konstantin Pavlovich; and Belyanov, Sergei Alexandrovich. Device for heat treatment of finely dispersed material. 3,724,176, Cl. 55-269.000.
Vockenhuber, Karl: *See*—
Von Belvard, Peter Revy; and Scheiber, Robert, 3,724,349.
Vogelhuber, Fred W.: *See*—
Vogelhuber, Fred W.; Vogelhuber, Heather; and McMillan, Gilman C., 3,724,677.
Vogelhuber, Fred W.; Vogelhuber, Heather; and McMillan, Gilman C., 1/2 to Vogelhuber, Fred W., Vogelhuber, Heather; jointly and 1/2 to Moss, Gene D. Portable garment rack and blank therefor. 3,724,677, Cl. 211-96.000.
Vogelhuber, Heather: *See*—
Vogelhuber, Fred W.; Vogelhuber, Heather; and McMillan, Gilman C., 3,724,677.
Vogelhuber, Heather; jointly: *See*—
Vogelhuber, Fred W.; Vogelhuber, Heather; and McMillan, Gilman C., 3,724,677.
Vogiatzis, John P.: *See*—
Robinson, Joseph D.; and Vogiatzis, John P., 3,725,777.
Voigt, Hartman; Schneck, Erich; Gunther, Klaus; and Noha, Klaus, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for recovering heat from gas mixtures obtain by the thermal cracking of hydrocarbons. 3,725,491, Cl. 260-679.0r.
Voland, Dieter; and Scheer, Erich, to Kieninger and Obergfell. Electric program switch for automatic appliance. 3,725,618, Cl. 200-46.000.
Vollum, Charles Howard, to Tektronix, Inc. Deflection factor indicating apparatus. 3,725,724, Cl. 315-24.000.
Von Belvard, Peter Revy; and Scheiber, Robert, to Vockenhuber, Karl and Hauser, Raimund. Viewfinder. 3,724,349, Cl. 95-44.00r.
Von Der Eltz, Hans-Ulrich; and Gross, Richard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process and apparatus for space-dyeing of polyester or polyamide fibres or threads. 3,724,997, Cl. 8-14.000.
Von Esch, Anne Mary; and Crovetti, Aldo Joseph, to Abbott Laboratories. 3,5-Substituted-1,2,4-oxadiazole inner quaternary ammonium salts. 3,725,424, Cl. 260-296.00r.
von Ohain, Hans J. P.: *See*—
Campbell, William S.; and von Ohain, Hans J. P., 3,724,784.
Voser, Walter, to Ciba-Geigy Corporation. Process for the recovery of hydrophilic antibiotics. 3,725,400, Cl. 260-243.00c.
Vosper Thornycroft Limited: *See*—
Collis, Michael Edward Richard, 3,724,419.
Voss, James R.; and Ferry, William R., to AMBAC Industries, Incorporated. Engine govenor system with signal-loss protection and controlled oscillator circuit suitable for use therein. 3,724,433, Cl. 123-102.000.
Vossberg, Carl A. Method for polarimetric analysis. 3,724,952, Cl. 356-114.000.
Vyzkumny ustav bavlnarsky: *See*—
Jekl, Frantick; Mateju, Vladimir; Pech, Josef; and Hrdina, Karel, 3,724,508.
Wachtel, Alan, to Sanders Associates, Inc. Video buffer. 3,725,573, Cl. 178-6.6dd.
Wada, Mitsuo; Nishimoto, Kazuyuki; Aoki, Masaki; and Iida, Yoshio, to Matsushita Electric Industrial Co., Ltd. Thick film varistor and method for making the same. 3,725,836, Cl. 338-21.000.
Waehner, Glenn C., to United Aircraft Corporation. Wide-band magnetic yoke deflection system. 3,725,727, Cl. 315-27.0td.
Wagener, Kurt: *See*—
Mayr, Anton; Wagener, Kurt; Adolf, Johann Ditrich; Pette, Heinrich; and Petzoldt, Klaus, 3,725,542.
Wagensommer, Joseph; Lauria, Richard J.; and Staib, John H., to Esso Research and Engineering Company. Process for preparing elastomers of ethylene and C_3-C_{16} alpha olefins. 3,725,364, Cl. 260-80.780.
Wagner Electric Corporation: *See*—
Atkins, Carl E., 3,725,748.
Wagner, Robert J. Position sensitive alarm with magnetic latching pendulum switch. 3,725,896, Cl. 340-282.000.
Wahl, Errol H., to Procter & Gamble Company, The. Color and odor stabilized dry aerosol antiperspirant. 3,725,540, Cl. 424-46.000.
Wahlig, Helmut: *See*—
Rogalski, Werner; Jonas, Rochus; Wahlig, Helmut; and Bergmann, Rolf, 3,725,390.
Wainer, Eugene; Rose, Selwyn H.; and Harkulich, Theodore M., to Horizons Incorporated. Light amplifiers. 3,724,066, Cl. 29-592.000.
Wainwright, Ralph E.; and Liston, Edward R., to Dart Industries, Inc. Automatic hot end coating hood lifter. 3,724,641, Cl. 198-40.000.
Waite, William: *See*—
Hawkins, John Charles; and Waite, William, 3,724,796.
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, to Nippondenso Kabushiki Kaisha. Automatic transmission control system for automobiles. 3,724,293, Cl. 74-866.000.
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Wakatsuki, Toshiyuki: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.
Wakizaka, Samon: *See*—
Nakano, Satoshi; Azuma, Keiichi; Oba, Seiichiro; Wakizaka, Samon; and Nakamura, Sunichi, 3,725,507.

Walander, Kar Ove Torgny: *See—*
Fonden, Per Borje; and Walander, Kar Ove Torgny, 3,724,333.
Walander, Karl Ove T.: *See—*
Fonden, Per Borje; and Walander, Karl Ove T., 3,724,787.
Wald, Milton M.: *See—*
Kiovsky, Thomas E.; and Wald, Milton M., 3,725,239.
Walden, Mayo K.: *See—*
Hunter, Irving R.; and Walden, Mayo K., 3,725,425.
Waldenmayer, Donald W.: *See—*
Malmer, Michael M., Jr.; Perkins, Cornelius C.; Waldenmayer, Donald W.; Chowning, Patrick J.; and Gardner, Leonard R., 3,725,868.
Walkenhorst, Wilhelm, to Bergwerksverband GmbH. Electrically operated dust mask. 3,724,174, Cl. 55-123.000.
Walker, Donald. Method for educational test preparation. 3,724,103, Cl. 35-48.00a.
Walker, James L.: *See—*
Tarshis, Lemuel A.; and Walker, James L., 3,725,057.
Walker, John H., to Phillips Petroleum Company. Poly(arylene sulfide) composition and method for decreasing the melt flow of poly(arylene sulfide). 3,725,362, Cl. 260-79.000.
Wallace, Floyd L.: *See—*
Breitfuss, Thomas K.; Wallace, Floyd L.; and Zicaro, Joseph P., 3,724,768.
Wallshein, Melvin. Brackets for supporting arch wires, and adapted to junction in orthodontic procedures in systems for tilting, uprighting and turning teeth. 3,724,074, Cl. 32-14.00a.
Wally, Joseph H., Jr.; and Wilson, Samuel E., to Western Blue Print Co. Overhead rail supporting structure for photographic apparatus. 3,724,948, Cl. 355-55.000.
Walsh, Edward Nelson, to Stauffer Chemical Company. O-loweralkyl-S-(2-oxopropyl-1) phosphonodithioates. 3,725,512, Cl. 260-946.000.
Walsh, William Henry: *See—*
Fernandes, Harold; and Walsh, William Henry, 3,725,532.
Walton, Roger H., to United States of America, Air Force. Assembly of a pallet towing bridle and method of use. 3,724,814, Cl. 254-133.000.
Wambold, John N.: *See—*
Velten, Edmund M.; Jagaciak, George J.; Wambold, John N.; and Epstein, Arthur, 3,724,050.
Wandel u. Goltermann: *See—*
Bayer, Herbert, 3,725,784.
Wang, Jerry Chi, to Dart Industries, Inc. Aging of impregnated foamable beads. 3,725,320, Cl. 260-2.50b.
Wang, Jui Chung, to Union Carbide Corporation. Process for the separation of aromatic hydrocarbons from a mixed hydrocarbon feedstock. 3,725,254, Cl. 208-314.000.
Ward, John V.: *See—*
Deffner, John F.; Tucci, Edmond R.; Thayer, Helen I.; and Ward, John V., 3,725,483.
Wark, Emerson L.: *See—*
Pugh, Cecil C.; Wark, Emerson L.; and Rumpf, Richard O., 3,724,233.
Warneke, Carl J.; deceased (by Warneke, Mabel P.; administrator), to Sherwin-Williams Company, The. Curing photopolymerizable film-forming polymer coatings. 3,725,114, Cl. 117-93.1cd.
Warneke, Mabel P.: *See—*
Warneke, Carl J., 3,725,114.
Warner, Gene: *See—*
Hatcher, Cecil W.; and Warner, Gene, 3,724,900.
Warner-Lambert Company: *See—*
Genzer, Jerome; and Conrad, George, 3,725,413.
Morrison, Glenn C.; Shavel, John, Jr.; and Cetenko, Wiaczeslaw, 3,725,420.
Warnez, Guy, to Etablissement Microfilm Automatic Data Processing. Apparatus for the rapid, stepwise transport of strip. 3,724,736, Cl. 226-145.000.
Warren Fastener Corporation: *See—*
Richardson, Donald C., 3,724,812.
Wasser, Wolfgang: *See—*
Gawlick, Heinz; Marondel, Gunther; Sieglein, Werner; Wasser, Wolfgang; and Bendler, Hellmut, 3,724,381.
Waste Research and Reclamation Co., Inc.: *See—*
Mattice, William G.; and Sanford, David A., 3,725,262.
Waszolek, Walter R.: *See—*
Kehr, Clifton L.; and Waszolek, Walter R., 3,725,229.
Watanabe, Ichiro: *See—*
Suyama, Fujio; Yamamoto, Tokuo; Shimono, Kenichi; Kuwahara, Hirosi; Ishii, Masao; and Watanabe, Ichiro, 3,725,195.
Watanabe, Kiyoshi; Shimada, Yoshio; Kawaharada, Hajime; Suzuki, Kenji; and Tanaka, Fumio, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for fermentative production of yeast cells. 3,725,200, Cl. 195-28.00r.
Watanabe, Toshio: *See—*
Sugita, Keiji; Mochimaru, Hideaki; and Watanabe, Toshio, 3,724,944.
Watson, Roger W.: *See—*
Traise, Thornton P.; Watson, Roger W.; and Littel, Randel O., 3,725,480.
Watters, Richard: *See—*
Nurmohamed, Amin Mulji; and Watters, Richard, 3,725,818.
Watts, Eric Alfred: *See—*
Brown, David Maxwell; and Watts, Eric Alfred, 3,725,429.
Watts, John M. J.: *See—*
Keig, George A.; Smith, James C.; and Watts, John M. J., 3,725,092.
Waxman, Rudy. Extremity support attachment for intravenous feeding. 3,724,456, Cl. 128-133.000.
Weather-Rite, Inc.: *See—*
Weatherston, Richard N., 3,724,534.
Weatherston, Richard N., to Weather-Rite, Inc. Multiple zone control system with priority of service. 3,724,534, Cl. 165-12.000.
Weaver, Gerald Q., to Norton Company. Process for forming high density refractory shapes and the products resulting therefrom. 3,725,015, Cl. 29-182.100.
Weaver, Richard V.: *See—*
Short, Oliver A.; and Weaver, Richard V., 3,725,035.
Webber, Henry, to Westinghouse Canada Limited. Servo corner compensation for photoelectric rotary scan line tracers. 3,725,761, Cl. 318-577.000.
Weber, Guy, to La Cellopane. Method and apparatus for photoelectric reproduction of continuous relief originals. 3,724,028, Cl. 178-6.60a.
Weber, Heinz Paul: *See—*
Ulrich, Reinhard; and Weber, Heinz Paul, 3,725,809.
Weber, Kurt: *See—*
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, 3,725,395.
Weber, Lee A.: *See—*
Friedline, Leslie E.; Stevenson, Thomas E.; and Weber, Lee A., 3,725,949.
Webster Electric Company, Inc.: *See—*
Hubbard, Glenn R., 3,724,483.
Hubbard, Glenn R., 3,724,500.
Webster, Frank G.; and Taber, Robert C., to Eastman Kodak Company. Process for preparing 9-aryloxycarbocyanine compounds. 3,725,398, Cl. 260-240.600.
Webster, Jonathan C.; Sloan, Earl L., III; and Ganssen, Alexander, to United States of America, Air Force. Proton maser antenna tuning means. 3,725,798, Cl. 330-4.000.
Webster, Richard B.: *See—*
Murphree, Francis J.; Kennedy, Peter D.; and Webster, Richard B., 3,725,855.
Wegner, Herman E., to Alcan Research and Development Limited. Edge conditioning of metal strips. 3,724,251, Cl. 72-203.000.
Wegner, Peter: *See—*
Gehrke, Gunter; Hederich, Volker; Neeff, Rutger; and Wegner, Peter, 3,724,998.
Wehr, Robert D. Toilet bowl attachment. 3,723,998, Cl. 4-1.000.
Weidman, Joseph S.; Yee, Henry C.; Elliott, Jack G.; and Margosian, Zaven, to Bendix Corporation, The. Traffic responsive speed control system. 3,725,921, Cl. 343-7.0ed.
Weidman, Verne Wesley; and Yates, Paul C., to Du Pont de Nemours, E. I., and Company. Foamed alkali silicate binder compositions. 3,725,095, Cl. 106-75.000.
Weidner, Charles Leslie, to Johnson & Johnson. Heat curable elastomeric composition and products. 3,725,322, Cl. 260-3.000.
Weidner, Evert C.: *See—*
Pollack, Michael J.; and Weidner, Evert C., 3,725,133.
Weidner, Jack E., to Oster Corporation. Electric coffee maker having a plastic heating vessel. 3,725,642, Cl. 219-441.000.
Weight, Donald, to Monsanto Chemicals Limited. Footwear. 3,724,105, Cl. 36-44.000.
Weinberg, Elliott K. Passive wake quenching system using non-ablating materials sulfur and a solid noble gas fluoride. 3,725,282, Cl. 252-62.000.
Weisfeld, Lewis B.; Andreas, Holger; and Muller, Horst, to Ciba-Geigy Marienberg GmbH. Thermostabilized chlorine-containing polymers. 3,725,338, Cl. 260-45.75k.
Weiss, Anton G.: *See—*
Traber, Walter; and Weiss, Anton G., 3,725,555.
Welch, Albert B. Board game apparatus. 3,724,856, Cl. 273-131.0ab.
Welch, Earl S.; and Petelka, Roland J., to General Motors Corporation. Friction device for hydrodynamic unit rotor. 3,724,208, Cl. 60-343.000.
Weld-Record Corporation: *See—*
Wenrich, Carl M.; and Down, Bernard W., 3,725,637.
Wells, Dale K.: *See—*
Hendry, George O.; and Wells, Dale K., 3,725,709.
Wenco, Inc.: *See—*
Schnormeier, Theodore H., 3,724,131.
Wenrich, Carl M.; and Down, Bernard W., to Weld-Record Corporation. Voltage-current sensing system for welders and the like. 3,725,637, Cl. 219-136.000.
Wentworth, Henry C. Drapery rod installation template. 3,724,085, Cl. 33-189.000.
Wenzel, Werner: *See—*
Wenzel, Werner; Schenck, Hermann; and Gudenau, Heinrich-Wilhelm (said Gudenau assor. to said), 3,725,038.
Wenzel, Werner; Schenck, Hermann; and Gudenau, Heinrich-Wilhelm, said Gudenau assor. to said Wenzel, Werner and said Gudenau assor. to said Schenck, Hermann. Process for making polygon coke in coking chambers and coke so produced. 3,725,038, Cl. 117-46.0ca
Wepsic, James G.: *See—*
Avery, Roger E.; and Wepsic, James G., 3,724,467.
Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Makow, Abraham, 3,724,781.
Raess, Ulrich; and Jan, Daniel, 3,724,042.

Wernecke, Heinz C.: *See—*
Olsen, Harry C.; Tischler, Ludwig J.; and Wernecke, Heinz C., 3,724,730.
Olsen, Harry C.; Tischler, Ludwig J.; and Wernecke, Heinz C., 3,724,928.
Wernli, Max: *See—*
Szatmari, Franz; and Wernli, Max, 3,724,821.
Wescom, Inc.: *See—*
Andersen, Todd G., 3,725,683.
Wesolski, Henry J., to Allis-Chalmers Manufacturing Company. Process for plating articles with silver-palladium alloys. 3,725,219, Cl. 204-37.00r.
Wessells, Henry W., III; and Eggert, Walter S., Jr., to Budd Company, The. Joint construction. 3,724,153, Cl. 52-588.000.
West, Harry Bowman, to Du Pont de Nemours, E. I., and Company. Process for the preparation of chromium (III) nitrate complexes with trans-acids. 3,725,448, Cl. 260-438.50r.
West, Roger Frankland, to United Aircraft Corporation. CRT geometry correction with zero offset. 3,725,726, Cl. 315-27.0gd.
Westberg, Eric J. H.: *See—*
Unger, Hans Peter Olof; Westberg, Eric J. H.; and Schwartz, Stephan L., 3,724,747.
Westcoat Transmission Company Limited: *See—*
Awrey, Kenneth D., 3,724,273.
Western Blue Print Co.: *See—*
Wally, Joseph H., Jr.; and Wilson, Samuel E., 3,724,948.
Western Electric Company, Incorporated: *See—*
Anderson, Albin R.; Jennings, John D.; and Killerby, Walter E., 3,724,739.
Fuchs, Francis Joseph, Jr., 3,724,336.
Glosek, John J., 3,725,889.
LaValle, Thomas Alvin, 3,724,264.
LaValle, Thomas Alvin, 3,724,265.
Westerteiger, Wilhelm: *See—*
Freitag, Herbert; and Westerteiger, Wilhelm, 3,724,797.
Westinghouse Air Brake Company: *See—*
Balukin, Richard F., 3,724,912.
Darrow, John O. G., 3,725,679.
Darrow, John O. G., 3,725,802.
Pascoe, Frank T., 3,725,699.
Westinghouse Brake and Signal Company Limited: *See—*
Garrett, John Mansell, 3,725,752.
Jordan, John H., 3,725,867.
King, Kenneth Gordon, 3,725,728.
Maskery, Arthur, 3,724,392.
Westinghouse Brake English Electric Semi-Conductors Limited: *See—*
Garrett, John Mansell, 3,725,753.
Westinghouse Bremsen- und Apparatebau G.m.b.H.: *See—*
Reinecke, Erich, 3,724,607.
Westinghouse Canada Limited: *See—*
Webber, Henry, 3,725,761.
Westinghouse Electric Corporation: *See—*
Bratkowski, Walter V.; and Pittman, Paul F., 3,725,807.
Bryant, Ozro, 3,724,214.
Cantrell, Roger E.; and Sturiale, Louis A., 3,724,062.
Davidson, Cliff I.; and Laing, Charles F., 3,725,914.
Fink, Robert W.; and Boyko, Eugene S., 3,725,635.
Fischer, Frederick K., 3,724,967.
Fischer, William H.; and Cromer, Charles F., 3,725,623.
Harstead, Gunnar A.; Locante, John; and Russell, James G., 3,725,198.
Justice, James W. H., 3,725,571.
McCleerey, Earl W., 3,724,092.
McKinnon, John P., 3,725,619.
Misencik, John J., 3,725,741.
Murphy, Joseph, 3,725,811.
Pelly, Brian R., 3,725,768.
Petro, James; and Rively, Clair M., 3,725,720.
Thomas, Michael W., 3,725,833.
Yamasaki, George K., 3,725,716.
Zisa, William J., 3,725,745.
Westinghouse Electric Csrporation: *See—*
Schumacher, Berthold W.; and La Croix, Robert E., 3,725,633.
Weston, David C., to Interstate Restaurant Supply Company, Inc. Horizontally pivoted forklift apparatus. 3,724,699, Cl. 214-730.000.
Weston, William A., to N.V. Foco Nederland. Goods vehicles. 3,724,698, Cl. 214-518.000.
Westphal, Teddy M., to Hughes Aircraft Company. Pull tab arrangement for an easy open end. 3,724,709, Cl. 220-54.000.
Westvaco Corporation: *See—*
Forbes, Hampton E., Jr., 3,724,650.
Wetherill, Lewis A.: *See—*
Graham, William; and Wetherill, Lewis A., 3,725,397.
Weyerhaeuser Company: *See—*
Brookhyser, Byron B.; Erickson, Harold E.; and Perry, Glenn R., 3,725,183.
Wham-O Mfg. Co.: *See—*
Gillespie, Richard L., Sr., 3,724,122.
Wheel Carrier Holdings (Proprietary) Limited: *See—*
Potgieter, Marilyn Jean; and Potgieter, Maurice Stephen, 3,724,731.
Wheeler, Clayton A., to Monsanto Company. Apparatus for protecting an extrusion head from over pressure. 3,724,986, Cl. 425-154.000.
Wheeler, Douglas W., to Signal Oil and Gas Company. Waste water treatment process. 3,725,264, Cl. 210-44.000.
White, Bobby L.: *See—*
Carlin, Edward T.; and White, Bobby L., 3,724,078.
White, Earl R.: *See—*
Bose, Elaine A.; and White, Earl R., 3,725,406.
White, William Harold; and Dworschack, Roberg George, to Standard Brands Incorporated. Enzyme treatment. 3,725,202, Cl. 195-66.00r.
Whittaker Corporation: *See—*
Kaufmann, Albert R., 3,725,517.
Whitten, Frank R.: *See—*
Urbanosky, Harold J.; and Whitten, Frank R., 3,724,540.
Whittington, Billy Joe: *See—*
Robinson, John W.; and Whittington, Billy Joe, 3,725,560.
Wichsteed, Robert James; and Wood, David Henry, to Spiro Engineering Limited. Apparatus for spreading butter and like spreadable substances. 3,724,414, Cl. 118-1.000.
Wickersheim, Kenneth A.: *See—*
Buchanan, Robert A.; Tecotzky, Melvin; and Wickersheim, Kenneth A., 3,725,704.
Wickham, John L.; Ramstrom, Lee W.; Wordsworth, Albert G.; and Meloni, Robert A., to Black and Decker Manufacturing Company, The. Collet chuck operated by throttle control for rotary power tool. 3,724,563, Cl. 173-163.000.
Widerby, Lennart, to Aktiebolaget Svenska Flaktfabriken. Joint between fireproof and pressuretight wall and ceiling elements. 3,724,886, Cl. 287-189.36d.
Wiedeman, Robert A.; and Hillesland, Harold L., to United States of America, Air Force. Grounded multilayer insulation. 3,725,564, Cl. 174-6.000.
Wiedenmann, Wolfgang: *See—*
Ohmann, Friedrich; Otto, Rudolf; and Wiedenmann, Wolfgang, 3,725,900.
Wilde, Sheldon L., to H-C Industries, Incorporated. Container marker and inking apparatus therefor. 3,724,365, Cl. 101-40.000.
Wilhelm, Frederick C. Hydrocarbon conversion catalyst. 3,725,304, Cl. 252-441.000.
Wilkening, Hermann: *See—*
Asbeck, Werner; and Wilkening, Hermann, 3,724,249.
Wilkinson, Geoffrey, to Johnson, Matthey & Co., Limited. Catalyst compositions formed by transition metal cations and methods of making and using such catalysts. 3,725,305, Cl. 252-429.00r.
Wilkinson, Raymond Westrop: *See—*
Woodhead, James Louis; Dell, Ronald Michael; Junkinson, Anthony Richard; and Wilkinson, Raymond Westrop, 3,725,298.
Williams, Ferd E.: *See—*
Nozik, Arthur Jack; Tribit, Samuel; and Williams, Ferd E., 3,725,099.
Williams, Frank R.: *See—*
Jordan, Merrill E.; Burbine, William G.; and Williams, Frank R., 3,725,103.
Williams, Richard M.: *See—*
Rodgers, John T.; Williams, Richard M.; and Larsen, Richard J., 3,725,110.
Willke, Theodore L.: *See—*
Lawson, Maurice O.; and Willke, Theodore L., 3,725,737.
Willmund, Wolf-Dieter: *See—*
Stein, Werner; Plapper, Jurgen; and Willmund, Wolf-Dieter, 3,724,999.
Wilson, David E.: *See—*
Thompson, Gene C.; Radomski, Joseph W.; and Wilson, David E., 3,724,089.
Wilson, John C.: *See—*
Hamb, Frederick L.; and Wilson, John C., 3,725,070.
Wilson, Josie Dianne. Means for securing hair pieces and the like to the head and a method of using same. 3,724,470, Cl. 132-46.00r.
Wilson, Lynn E. Wheel-less trailer. 3,724,694, Cl. 214-450.000.
Wilson, Raymond F.; Peck, Reese A.; Carter, Norman D.; Cole, Edward L.; and Hess, Howard V., to Texaco Inc. Process for improving a hydrocarbon charge stock by contacting the charge with water at elevated temperature and pressure. 3,725,250, Cl. 208-208.00.
Wilson, Samuel E.: *See—*
Wally, Joseph H., Jr.; and Wilson, Samuel E., 3,724,948.
Wince, Vearl S., to Holophane Company, Inc. Luminaire comprising means for reducing temperature of exterior refractor. 3,725,697, Cl. 240-93.000.
Windal, Georges: *See—*
Retali, Roger; Dambrine, Francis; Giorgi, Jean Claude; and Windal, Georges, 3,725,127.
Windecker, John C.; and Hayman, William. Dental instrument. 3,724,081, Cl. 32-40.00r.
Windholz, Thomas B.: *See—*
Patchett, Arthur A.; and Windholz, Thomas B., 3,725,439.
Windmoller & Holscher: *See—*
Brockmuller, Friedrich Franz, 3,724,340.
Kuckhermann, Gustav, 3,724,840.
Wingate, Sidney A.: *See—*
Breslow, Donald H.; and Wingate, Sidney A., 3,725,904.
Winge, John L., to Bendix Corporation, The. Brake shoe centering mechanism. 3,724,611, Cl. 188-216.000.
Wingler, Frank: *See—*
Erdmenger, Rudolf; Ullrich, Martin; Germerdonk, Rolf; Pedain, Josef; Quiring, Bernd; and Wingler, Frank, 3,725,340.
Winterburn, Stanley Pilkington: *See—*

Baker, William Albert; Barker, Anthony Sydney Charles; Holden, John James Edmund; and Winterburn, Stanley Pilkington, 3,724,252.

Winters, Donald C., to Congoleum Industries, Inc. Fibrous base felt containing cellulosic fibers, 10% to 50% asbestos fibers, and 1% to 5% of water soluble catronic polyacrylic resin as a drainage aid. 3,725,196, Cl. 162-145.000.

Wirth, David Griffith, Jr.: *See—*
Levy, Newton, Jr.; Wirth, David Griffith, Jr.; and Rettew, Richard Raymond, 3,725,094.

Wirth, Gallo & Co.: *See—*
Saner, Kaspar, 3,724,572.
Saner, Kaspar, 3,724,573.

Wirth, Wolf-Dieter; Muller, Erwin; Blahak, Johannes; and Rohr, Harry, to Farbenfabriken Bayer Aktiengesellschaft. Blowing agents. 3,725,321, Cl. 260-2.50r.

Wisdom, Gerald F. Trailer mounted roundabout amusement device. 3,724,842, Cl. 272-29.000.

Wismer, Marco: *See—*
Parker, Gordon M.; Wismer, Marco; and Hahn, Ernest A., 3,725,116.

Wisner, Kenneth R. Rotatable magnetic transducer head. 3,725,610, Cl. 179-100.20c.

Wistuba, Herbert: *See—*
Opderbeck, Fritz; Ploetz, Theodor; and Wistuba, Herbert, 3,725,107.

Wittmer, Paul: *See—*
Bolte, Herbert; Wittmer, Paul; and Heil, Eduard, 3,725,506.

Wittner, Rudolf. Pyramidal metronome. 3,724,203, Cl. 58-130.00r.

Witton-James Limited: *See—*
Baker, Noel John, 3,724,033.

Witzell, Bruce E.: *See—*
Shen, Tsung-Ying; Greenwald, Richard B.; Jones, Howard; Linn, Bruce O.; and Witzell, Bruce E., 3,725,548.

Wixon, Harold E.: *See—*
Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., 3,725,473.

Wolf, James M., to Chemotronics, Incorporated. Method for sterilization. 3,725,002, Cl. 21-2.000.

Wolf, Richard N., to Memodyne Corporation. Cassette loading magnetic tape driver. 3,724,780, Cl. 242-206.000.

Wolfarth, Eugene F.; Smith, Donald A.; Farran, Charles F.; and Dappen, Glen M., to Eastman Kodak Company. Developer scavengers for image transfer systems. 3,725,063, Cl. 96-29.00d.

Wolk, Ronald H.: *See—*
Alpert, Seymour B.; Wolk, Ronald H.; Chervenak, Michael C.; and Nongbri, Govanon, 3,725,251.
Johnson, Axel R.; and Wolk, Ronald H., 3,725,247.

Wolverton, Billy C., to United States of America, Air Force. Method of decontaminating an organophosphorus insecticide. 3,725,269, Cl. 210-59.000.

Wong, Morton M.: *See—*
Gomes, John M.; Uchida, Kenji; and Wong, Morton M., 3,725,221.

Wood, David Henry: *See—*
Wichsteed, Robert James; and Wood, David Henry, 3,724,414.

Wood, George R. Motorcycle chain guard. 3,724,582, Cl. 180-33.00r.

Wood, Hamilton L., to Acme Visible Records, Inc. Mounting means for carrier. 3,724,793, Cl. 248-247.000.

Wood, Hamish C. S.; and Stuart, Alexander, to University of Strathclyde. Pteridine derivatives and method. 3,725,408, Cl. 260-251.500.

Wood, John W., to Black and Decker Manufacturing Company, The. Attachment coupling for power tool. 3,724,237, Cl. 64-4.000.

Wood, Walter Bruce. Filtered air breathing zone. 3,724,172, Cl. 55-97.000.

Woodhead, James Louis; Dell, Ronald Michael; Junkinson, Anthony Richard; and Wilkinson, Raymond Westrop, to United Kingdom Atomic Energy Authority. Preparation of mixed oxides. 3,725,298, Cl. 252-317.000.

Woodle, Robert A., to Texaco Inc. Production of lubricating oils. 3,725,245, Cl. 208-86.000.

Woodward, Oakley McDonald, to United States of America, Navy, mesne. Compact waveguide-coax transition. 3,725,824, Cl. 333-21.00r.

Woodworth, William H.: *See—*
Crawford, Jack A.; Lewis, George R.; and Woodworth, William H., 3,725,576.

Woog, Rudolf: *See—*
Lassmann, Heribert; and Woog, Rudolf, 3,724,980.

Woolley, Richard P., to Ball Brothers Research Corporation. Assembly for measuring the magnitude of unbalance in an object. 3,724,279, Cl. 73-462.000.

Woosley, Kenneth D.: *See—*
Fuller, Sterritt R., Jr.; Munzel, Howard E.; and Woosley, Kenneth D., 3,725,118.

Wordsworth, Albert G.: *See—*
Wickham, John L.; Ramstrom, Lee W.; Wordsworth, Albert G.; and Meloni, Robert A., 3,724,563.

Work, Josiah: *See—*
Joseph, Robert T.; and Work, Josiah, 3,725,034.

Worrel, Calvin J., to Ethyl Corporation. Lubricant compositions. 3,725,277, Cl. 252-51.50r.

Worth, Joseph H.: *See—*
Seil, Kenneth F.; and Worth, Joseph H., 3,725,639.

Worthington, Carl A. Modular building structure. 3,724,142, Cl. 52-73.000.

Worthington Corporation: *See—*
Meyerson, Norman L., 3,724,110.

Woycechowsky, Brian J., to Singer Company, The. Method of perspective transformation in scanned raster visual display. 3,725,563, Cl. 35-10.200.

Wright, Athol Currie: *See—*
Penno, Edward; Penno, Mary; and Wright, Athol Currie, 3,725,088.

Wright, Jerry L. Detasseling device. 3,724,184, Cl. 56-51.000.

Wright, Kenneth F. A., to Exceltronic Industries, Ltd. Dishwashing machine. 3,724,636, Cl. 198-19.000.

Wright, Larry R.: *See—*
Schaeffer, Dennis R.; and Wright, Larry R., 3,725,674.

Wright, Luther M.: *See—*
Rosborough, Robert S., Jr.; and Wright, Luther M., 3,725,168.

Wright, William H., to Zumbiel, C. W., Company, The. Beverage bottle carrier. 3,724,714, Cl. 220-113.000.

Wrisberg, Johannes; Andersen, Kjeld Jorn; and Mogensen, Erik, to Haldor Frederik Axel Topsoe and Fluor Corporation. Catalytic steam cracking of hydrocarbons and catalysts therefor. 3,725,495, Cl. 260-683.00r.

Wszolek, Walter R.: *See—*
Kehr, Clifton L.; and Wszolek, Walter R., 3,725,228.

Xerox Corporation: *See—*
Cassano, James R.; and Sanza, Frank J., 3,724,939.
Draugelis, Vaidevutis C.; Hartman, William R., Jr.; Langdon, Michael J.; and McCarroll, Alan F., 3,724,943.
Fenity, Robert D., 3,725,283.
Heeks, Robert E.; and Sullivan, Donald P., 3,725,073.
Honjo, Satoru; Matsumoto, Seiji; and Takimoto, Masaaki, 3,724,941.
Komp, Richard J., 3,725,059.
Latone, Salvatore; and Stanley, Michael R., 3,724,422.
Shanly, Alan L., 3,724,019.
Till, Henry R., 3,724,020.

Yaccarino, Joseph N.: *See—*
Somerville, James; Smith, Donald F.; and Yaccarino, Joseph N., 3,724,374.

Yamada, Keisho; Nishimura, Kenji; Furusaki, Shinichi; Toshimitsu, Tatsuo; and Inaba, Yukio, to Ube Industries, Ltd. Process for purifying adiponitrile. 3,725,459, Cl. 260-465.80r.

Yamada, Osamu: *See—*
Ohmori, Kaour; Nakajimatokyo, Mituo; Ishida, Shuichi; and Yamada, Osamu, 3,725,445.

Yamada, Shoji, to Nippon Oil Company, Limited. Process for the purification of mineral oil. 3,725,253, Cl. 208-211.000.

Yamada, Takashi; and Matsumoto, Toyosaku, to Nippon Gakki Seizo Kabushiki Kaisha. Soundboards for string instruments having plastic foam body with harder outer layers. 3,724,312, Cl. 84-193.000.

Yamaguchi, Terumoto; and Amano, Yoshinao, to Nippondenso Co., Ltd. Heat exchanger. 3,724,538, Cl. 165-152.000.

Yamamoto Kagaku Gosei Co., Ltd.: *See—*
Yamamoto, Kenji; Sasaki, Nobuharu; and Terayama, Mutsuo, 3,725,416.

Yamamoto, Katsuro, to Bridestone Liquefied Gas Company, Limited. Low temperature liquefied gas storage tank and tanker. 3,724,703, Cl. 220-9.0lg.

Yamamoto, Kenji; Sasaki, Nobuharu; and Terayama, Mutsuo, to Yamamoto Kagaku Gosei Co., Ltd. 7-Piperidinofluoran. 3,725,416, Cl. 260-293.580.

Yamamoto, Shinji: *See—*
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.

Yamamoto, Sigeo: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Kawano, Suminsri; Fjuimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Tanaka, Katsutoshi; Ooishi, Tadashi; and Takeda, Hisami, 3,725,514.
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa; Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,725,546.

Yamamoto, Tokuo: *See—*
Suyama, Fujio; Yamamoto, Tokuo; Shimono, Kenichi; Kuwahara, Hirosi; Ishii, Masao; and Watanabe, Ichiro, 3,725,195.

Yamamura, Toshio; Omote, Yuichi; Sato, Shiro; and Kani, Hiyama, to Kanto Denka Kogyo Co., Ltd. Process for recovering pure aqueous solution of ferric chloride and aqueous solution of metal chlorides free of ferric chloride from ferrous metal material. 3,75,527, Cl. 423-139.000.

Yamasaki, George K., to Westinghouse Electric Corporation. Hollow cathode device with improved spectral light output and stability. 3,725,716, Cl. 313-185.000.

Yamashita, Takehiko: *See—*
Nakai, Kenichi; and Yamashita, Takehiko, 3,725,730.

Yamasue, Koutaro: *See—*
Shiba, Keisuke; Hinata, Masanao; Yamasue, Koutaro; and Kondo, Tokiharu, 3,725,074.

Yamazaki, Keiji, to Minolta Camera Kabushiki Kaisha. Synchronizer in camera. 3,724,345, Cl. 95-11.50r.

Yamazaki, Osami: *See*—
Nara, Kiyoshi; Ohta, Kazuhiko; Katamoto, Kazuyoshi; Yamazaki, Osami; and Fukudi, Hideo, 3,725,474.
Yancey, Thomas A.: *See*—
Cabell, Robert G.; Yancey, Thomas A.; Linville, Roy Norman; and Harrington, Daniel J., 3,724,439.
Yang, Tung Han: *See*—
Anderson, Steven A.; Barker, Eugene C.; and Yang, Tung Han, 3,724,681.
Yankevich, Kira Boleslavovna: *See*—
Leliovsky, Anton Felixovich; Ryabinin, Vladimir Alexandrovich; Terra, Karl Romanovich; and Yankevich, Kira Boleslavovna, 3,725,717.
Yashica Company, Ltd.: *See*—
Takahashi, Makoto; and Hashimoto, Takao, 3,724,955.
Yasudi, Susumu; and Sato, Norio, to Nippon Electric Company, Limited. Gas laser tube with a discharge path defined by rod-shaped members made of ion bombardment resistive insulator material. 3,725,813, Cl. 331-94.500.
Yates, Edward W., to Cincinnati Milacron Inc. Plateau milling scheme for hydraulic tracers. 3,724,328, Cl. 90-62.00r.
Yates, Paul C.: *See*—
Weidman, Verne Wesley; and Yates, Paul C., 3,725,095.
Yazawa, Hiroshi. Beater and method for making same. 3,724,971, Cl. 416-227.000.
Yeakley, Richard L.: *See*—
Bean, Kenneth E.; and Yeakley, Richard L., 3,725,160.
Yee, Henry C.: *See*—
Weidman, Joseph S.; Yee, Henry C.; Elliott, Jack G.; and Margosian, Zaven, 3,725,921.
Yen, Chu-Sun, to Hewlett-Packard Company. Switch-type D.C. to D. C. converter. 3,725,765, Cl. 321-2.000.
Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
Banin, Amos, 3,725,528.
Yoder, Max N. Hybrid electron-beam, semiconductor-diode amplifying device. 3,725,803, Cl. 330-46.000.
Yokogawa Electric Works, Limited: *See*—
Tamate, Tokutaro; Habuchi, Hirokazu; and Hirayama, Tsutomu, 3,724,957.
Yokoyama, Taizo: *See*—
Nihyakumen, Kouzi; Kouchi, Toshihiro; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,725,066.
Yongue, James M., to RCA Corporation. Common base amplifier terminating circuit for high impedance detecting apparatus. 3,725,577, Cl. 178-7.30r.
Yoo, Jin Sun, to Atlantic Richfield Company. Nickel carbonyl complex catalyst. 3,725,306, Cl. 252-430.000.
Yoo, Jin Sun, to Atlantic Richfield Company. Process for homopolymerizing acrylonitrile. 3,725,373, Cl. 260-88.70r.
Yoshida, Makoto; Tsuda, Momotoshi; Oishi, Yasushi; and Nakazyo, Kiyoshi, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive materials containing a novel yellow-forming coupler. 3,725,072, Cl. 96-55.000.
Yoshida, Susumu; and Ishigaki, Yoshio, to Sony Corporation. Oscilloscope apparatus. 3,725,725, Cl. 315-26.000.
Yoshikawa, Hiroshi: *See*—
Maezawa, Shiro; Yoshikawa, Hiroshi; Sakamoto, Kenji; Fujii, Jun; and Hashimoto, Makoto, 3,725,208.
Yoshimura, Shoichiro: *See*—
Katagiri, Takeo; Hiromori, Kunio; Yoshimura, Shoichiro; Suda, Kazuyoshi; and Tanaka, Jinichi, 3,724,657.
Yoshitake, Hiroshi: *See*—
Ito, Ken; Kaminaka, Hiroshi; Kotera, Norio; Yamamoto, Shinji; Dogane, Iwao; Shigehiro, Kosuke; Kuruma, Hiroshi; Chinuki, Takashi; Yoshitake, Hiroshi; Tanimoto, Kenji; Hasegawa, Shinichi; and Kobayashi, Nobuki, 3,725,484.
Young, Elliott: *See*—
Austin, Peter William; Crabtree, Allen; Leng, John Lindley; Robert, Denis; Ridyard, Annesley; and Young, Elliott, 3,725,383.
Young, Elwyn R.: *See*—
Scanlon, Patricia M.; and Young, Elwyn R., 3,725,456.
Zabelka, Richard J.; and Smith, Lloyd H., to United States of America, Navy. Fax minefield clearing device. 3,724,319, Cl. 89-1.00m.
Zanpirri, Anthony P.; Trechock, Jack; and Joseph, Robert T., to FMC Corporation. Coating of reactive form coke by catalytic deposition of glanz carbon. 3,725,019, Cl. 44-10.00r.
Zeewy, Abraham: *See*—
Mc Connell, Howard M.; and Zeewy, Abraham, 3,725,756.
Zehavi, Samuel; Boivin, Joseph J. R.; Hamilton, Douglas D.; and Ranzenhofer, Raoul, 1/3 each to Canadian International Paper Company, Quebec North Shore Paper Company and Abitibi St. Anne Paper Ltd. Tree feed roll assembly. 3,724,518, Cl. 144-247.000.
Zeingenberger, Arno; and Hagel, Adolf, to Liebrandt, Karl. Warp knitting machine. 3,724,241, Cl. 66-86.00r.
Zeitlin, Alexander. Pressure vessel with connector fitting. 3,724,881, Cl. 52-192.000.
Zemek, Albert W.: *See*—
Holmes, Robert H.; and Zemek, Albert W., 3,724,055.
Zentz, William E., Jr., to Engelhard Minerals and Chemicals Corporation. Method for processing kaolin clay coating pigment and improved product thereof. 3,725,100, Cl. 106-288.00b.
Zicaro, Joseph P.: *See*—
Breitfuss, Thomas K.; Wallace, Floyd L.; and Zicaro, Joseph P., 3,724,768.
Zickendraht, Christian; and Fasciati, Alfred, to Ciba-Geigy AG. Substituted phenyl-azo-phenyl-azo-phenyl compounds. 3,725,384, Cl. 260-186.000.
Zielinski, Erich, to Rheinmetall G.m.b.H. Gun built into an armored turret with a rotating magazine. 3,724,324, Cl. 89-36.00k.
Zielke, Darrell W., to Superscope, Inc. Hub-platform assembly and loop-sizing method. 3,724,771, Cl. 242-55.19a.
Zilcosky, Hector Joseph, to Ensign-Bickford Company, The. Caseless smoke grenade including polyvinyl chloride binder. 3,724,382, Cl. 102-65.000.
Zinski, Peter: *See*—
Brevko, Robert; Bitsura, Michael P.; Mucka, John R.; and Zinski, Peter, 3,724,164.
Zirps, Wilhelm: *See*—
Ellwanger, Hans; Kraisel, August; Kraus, Walter; and Zirps, Wilhelm, 3,724,003.
Zisa, William J., to Westinghouse Electric Corporation. Voltage surge protection device for electric meters. 3,725,745, Cl. 317-104.000.
Zober, Ben P.: *See*—
Harris, Sterling G.; and Zober, Ben P., 3,724,031.
Zola, John C. Small particle dispersion coating composition. 3,725,089, Cl. 106-15.0fp.
Zoroglu, Demir S., to Motorola, Inc. Method of making an IGFET device with reduced gate-to-drain overlap capacitance. 3,725,151, Cl. 148-187.000.
Zoschak, Robert J., to Foster Wheeler Corporation. Heat flux sensing device. 3,724,267, Cl. 73-190.00h.
Zuber, Chauncey E., to Zuber, E. F., Engineering & Sales Co. Restraining pen. 3,724,027, Cl. 17-1.00a.
Zuber, E. F., Engineering & Sales Co.: *See*—
Zuber, Chauncey E., 3,724,027.
Zuest, Armin: *See*—
Schindler, Walter; Schmid, Erich; and Zuest, Armin, 3,725,411.
Zumbiel, C. W., Company, The: *See*—
Wright, William H., 3,724,714.
Zundel, Arthur P., to National Can Corporation. Aerosol safety can. 3,724,727, Cl. 222-397.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 3RD DAY OF APRIL, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Alliger, Glen, to The Firestone Tire & Rubber Co. Solution polymerization. T909,006, 4–3–73, Cl. 260—5.

Combs, Robert L., and W. C. Wooten, Jr. Heat stable microencapsulated fire extinguishing agents. T909,001, 4–3–73, Cl. 252—2.

Du Pont de Nemours, E. I., and Co.: *See*—
Fruehauf, Vernon P. T909,008.

Firestone Tire & Rubber Co., The: *See*—
Alliger, Glen. T909,006.

Fruehauf, Vernon P., to E. I. Du Pont de Nemours and Co. Netting member. T909,008, 4–3–73, Cl. 161—109.

Hercules Inc.: *See*—
Holloway, Paul E., Jr. T909,007.

Hicks, Gordon C., and M. M. Norton. Pan granulation of urea. T909,003, 4–3–73, Cl. 260—555.

Holloway, Paul E., Jr., to Hercules Inc. Preparation of film via a tubular process. T909,007, 4–3–73, Cl. 264—95.

International Business Machines Corporation: *See*—
Neuffer, Wilfred K. T909,004.

Jones, Jean E., and W. E. Yoerger. Supersensitizing dye combination for electrophotographic composition and element. T909,009, 4–3–73, Cl. 96—1.6.

Kelch, John R. Spatial filter. T909,010, 4–3–73, Cl. 350—162.

Kraftco Corp.: *See*—
Meisner, Donald F., and Robertson. T909,005.

McCollum, Anthony W. Novel 2,2-disubstituted-4-(1,1-dialkyl-2-ethanol)-1,3-dioxolanes and process for their production. T909,012, 4–3–73, Cl. 260—340.9.

Meisner, Donald F., and R. G. Robertson, to Kraftco Corp. Continuous manufacture of bread. T909,005, 4–3–73, Cl. 99—90.

Mosman, Richard R.: *See*—
White, Neil S., and R. R. Mosman. T909,002.

Neuffer, Wilfred K., to International Business Machines Corp. Calendering doctor blade cast ceramic sheets to control anisotropic firing shrinkage. T909,004, 4–3–73, Cl. 264—56.

Norton, Melvin M.: *See*—
Hicks, Gordon C., and Norton. T909,003.

Robertson, Raymond G.: *See*—
Meisner, Donald F., and Robertson. T909,005.

Schwier, John R. Dyeing process. T909,011, 4–3–73, Cl. 8—168.

White, Neil S., and R. R. Mosman. Identification printer for plastic parts. T909,002, 4–3–73, Cl. 101—27.

Wooten, Willis C., Jr.: *See*—
Combs, Robert L., and Wooten. T909,001.

Yoerger, William E.: *See*—
Jones, Jean E., and Yoerger. T909,009.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF APRIL, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Addressograph-Multigraph Corp.: *See*—
Mignore, Albert E. Re. 27,613.

Brunner, Augusto J., F. Costa, and L. Falcone, to Flexa Industria Materie Plastiche S.p.A. Waterproof fabric and method for forming the same. Re. 27,614, 4–3–73, Cl. 16—53.

Controls Company of America: *See*—
Strathearn, Donald M., Thornbery, and Willcox. Re. 27,609.

Costa, Fulvio: *See*—
Brunner, Augusto J., Costa, and Falcone. Re. 27,614.

Falcone, Luigi: *See*—
Brunner, Augusto J., Costa, and Falcone. Re. 27,614.

Flexa Industria Materie Plastiche S.p.A.: *See*—
Brunner, Augusto J., Costa, and Falcone. Re. 27,614.

Goodrich, B. F., Co., The: *See*—
Ruppel, Donald B., Reinhart, and Stalker. Re. 27,612.

Hellmann, Reinhold: *See*—
Schmidt, Donald L., and Hellmann. Re. 27,606.

Hofer, Heinz K., and F. Rehmsmeier, to Stubbe Maschinenfabrik G.m.b.H., mesne. Device for stroke limitation on hydraulically displaced mold carrier units on injection molds. Re. 27,607, 4–3–73, Cl. 425—450.

Lindh, Thorsten L.: *See*—
Rausing, Hans A., and Lindh. Re. 27,610.

Lubatti, Eugenio, and S. Pappalardo, to Montecatini Edison S.p.A. Production of boron nitride. Re. 27,608, 4–3–73, Cl. 423—290.

Mignore, Albert E., deceased, by Addressograph-Multigraph Corp., assignee. Master making and duplicating machine. Re. 27,613, 4–3–73, Cl. 101—132.5.

Montecatini Edison S.p.A.: *See*—
Lubatti, Eugenio, and Pappalardo. Re. 27,608.

Pappalardo, Salvatore: *See*—
Lubatti, Eugenio, and Pappalardo. Re. 27,608.

Rausing, Hans A., and T. L. Lindh. Packaging material including at least three lamination layers of materials having different viscosities, and a package produced therefrom. Re. 27,610, 4–3–73, Cl. 161—166.

Rehmsmeier, Friedrich: *See*—
Hofer, Heinz K., and Rehmsmeier. Re. 27,607.

Reinhart, Norman E.: *See*—
Ruppel, Donald B., Reinhart, and Stalker. Re. 27,612.

Ruppel, Donald B., N. E. Reinhart, and L. F. Stalker, to The B. F. Goodrich Company. Jet spray tank cleaner. Re. 27,612, 4–3–73, Cl. 239—227.

Schmidt, Donald L., and R. Hellmann. Aluminum plating process. Re. 27,606, 4–3–73, Cl. 117—37.

Song, John S. Easily openable sealed plastic closure and methods. Re. 27,611, 4–3–73, Cl. 220—27.

Stalker, Lee F.: *See*—
Ruppel, Donald B., Reinhart, and Stalker. Re. 27,612.

Strathearn, Donald M., J. M. Thornbery, and D. F. Willcox, to Controls Company of America. Timer. Re. 27,609, 4–3–73, Cl. 307—141.

Stubbe Maschinenfabrik G.m.b.H.: *See*—
Hofer, Heinz K., and Rehmsmeier. Re. 27,607.

Thornbery, James M.: *See*—
Strathearn, Donald M., Thornbery, and Willcox. Re. 27,609.

Willcox, Dale F.: *See*—
Strathearn, Donald M., Thornbery, and Willcox. Re. 27,609.

LIST OF DESIGN PATENTEES

Acer-Mex., S.A.: *See*—
Vecchi, Ramo and C. 226,640.

AMF Incorporated: *See*—
Baker, Jack F., and Fee. 226,631.

Ament, Myron J., to Wallace-Murry Corp. Bathroom vanity unit. 226,606, 4–3–73, Cl. D23—49.

Associated Mills, Inc.: *See*—
Grube, Clifford E. 226,635.

Aumann, Robert E., to Enrichment Reading Corporation of America, Inc. Electrical teaching unit. 226,610, 4–3–73, Cl. D25—1.

Autonumerics, Inc.: *See*—
Ponemon, Warren. 226,661.

Baker, Jack F., and R. W. Fee, to AMF Inc. Timer. 226,631, 4–3–73, Cl. D42—7.

Bartman, Louis. Vehicle traction board. 226,621, 4–3–73, Cl. D41—1.

Beck, Nevitt S. Water sled. 226,633, 4–3–73, Cl. D71—1.

Brindisi, Frederick J., to Qualitrol Corp. Pressure relief valve. 226,605, 4–3–73, Cl. D23–19.

Caunes, Andre. Ham product. 226,595, 4–3–73, Cl. D1—26.

Chapman, Norman L., to National Portion Control, Inc. Covered dish or similar article. 226,622, 4–3–73, Cl. D44—15.

Charles, Edwin D. Table. 226,599. 4–3–73, Cl. D6—20.

Charles, Edwin D. Table. 226,600, 4–3–73, Cl. D6—20.

Chasen, Lee R., to Coats & Clark, Inc. Hinge. 226,602, 4–3–73, Cl. D8—191.

Coats & Clark, Inc.: *See*—
Chasen, Lee R. 226,602.

Comp-Acct., Inc. : *See*—
Jackson, Randall D. 226,632.
Dennis, David D. : *See*—
Swenson, Paul F., Swenson, and Dennis. 226,634.
Dohan, John, Jr. Putter head design. 226,617, 4–3–73, Cl. D34—5.
Drew, Hilton H. Enclosure for roof mounted apparatus. 226,609, 4–3–73, Cl. D23—153.
Dunlop Limited : *See*—
Mills, Anthony M. 226,641.
Dvorin, Leonard M., to Hasbro Industries, Inc. Infant's riding toy. 226,618, 4–3–73, Cl. D34—15.
Enrichment Reading Corporation of America, Inc. : *See*—
Aumann, Robert E. 226,610.
Fee, Robert W. : *See*—
Baker, Jack F., and Fee. 226,631.
Fernandez, Mario F., and Rydeen, to Toro Mfg. Corp. Riding mower. 226,620, 4–3–73, Cl. D40—1.
Ferrier, Ted L. Safety razor head guard. 226,642, 4–3–73, Cl. D95—3.
Gentile, Phillip J. : *See*—
Shannon, James L., and Gentile. 226,628.
Shannon, James L., and Gentile. 226,629.
Gentile, Phillip J., and J. L. Shannon. Refuse container closure. 226,630, 4–3–73, Cl. D49—35.
Great Lakes Sports Mfg. Co. : *See*—
Swenson, Paul F., Swenson, and Dennis. 226,634.
Grube, Clifford E., to Associated Mills, Inc. Hydrotherapy apparatus. 226,635, 4–3–73, Cl. D83—1.
Gruber Systems Inc. : *See*—
Lawrence, William J. 226,607.
HHS Investors, Inc., mesne. : *See*—
Shuford, Grady W. 226,623.
Hale, John F. and F. J. Miller. Resilient ball for a twirling baton. 226,616, 4–3–73, Cl. D34—5.
Hasbro Industries, Inc. : *See*—
Dvorin, Leonard M. 226,618.
Henson, Carl G. Bracket for centering a camper unit within a truck bed. 226,604, 4–3–73, Cl. D14—6.
Holophane Co., Inc. : *See*—
Lewin, Ian. 226,625.
Jackson, Randall D., to Comp-Acct., Inc. Combined cash register and data terminal. 226,632, 4–3–73, Cl. D52—4.
Kamata, Eitaro, to Shoei Kakoh Co., Ltd. Helmet. 226,596, 4–3–73, Cl. D2—232.
Kamata, Eitaro, to Shoei Kakoh Co., Ltd. Helmet. 226,597, 4–3–73, Cl. D2—232.
Klotzbach, William O. Cushion. 226,601, 4–3–73, Cl. D6—201.
Knighten, Leonard B. Folding table for cleaning fish and small game. 226,603, 4–3–73, Cl. D11—1.
Lawrence, William J., to Gruber Systems Inc. Bathtub. 226,607, 4–3–73, Cl. D23—55.
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Plassmann, Herbert A. : *See*—
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Plassmann, Herbert A., to The Ohio Art Co. Toy spinning top. 226,619, 4–3–73, Cl. D34—15.
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Brindisi, Frederick J. 226,605.
Rauch, Margo J. Fabric pocketbook. 226,637, 4–3–73, Cl. D87—3.
Robinson, Barbara H. Telephone covers. 226,612, 4–3–73, Cl. D26—14.
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Fernandez, Mario F., and Rydeen. 226,620.
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Shannon, James L., and P. J. Gentile. Refuse container lid. 226,629, 4–3–73, Cl. D49—35.
Shannon, James L. : *See*—
Gentile, Phillip J., and Shannon. 226,630.
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Weber, Heinz. 226,639.
Toro Mfg. Corp. : *See*—
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Vecchi, Ramo and C. 226,640.
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CLASSIFICATION OF PATENTS

ISSUED APRIL 3, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
3R 3,723,992
237 3,723,993
248 3,723,994

CLASS 3
1 3,723,995
3,723,996
27 3,723,997

CLASS 4
1 3,723,998
142 3,723,999
148 3,724,000
166 3,724,001
222 3,724,002

CLASS 5
68 3,724,003
3,724,004
81R 3,724,005
109 3,724,006
236 3,724,007
348WB 3,724,008
360 3,724,009

CLASS 7
14.1A 3,724,010

CLASS 8
14 3,724,997
39 3,724,998
94.23 3,724,999
115.006 3,725,000
189 3,725,001

CLASS 9
2F 3,724,011
311 3,724,012

CLASS 12
20 3,724,013
146L 3,724,014

CLASS 13
6 3,725,558
14 3,725,559

CLASS 14
99 3,724,283

CLASS 15
98 3,724,016
121 3,724,017
244R 3,724,018
256.53 3,724,019
3,724,020

CLASS 16
45 3,724,022
53 3,724,023
116 3,724,024
128 3,724,025
163 3,724,021

CLASS 17
1A 3,724,027
1 3,724,026
11 3,724,029
41 3,724,030
48 3,724,031
52 3,724,032

CLASS 21
2 3,725,002
58 3,725,003

CLASS 23
230B 3,725,004
230R 3,725,006
232C 3,725,009
232E 3,725,005
253R 3,725,010
254E 3,725,011
254R 3,725,007
281 3,725,012
285 3,725,013
294 3,725,008
300 3,725,014

CLASS 24
67AR 3,724,033
116C 3,724,035
131C 3,724,034
245 3,725,547
261PC 3,724,036

CLASS 28
1.2 3,724,038
1.4 3,724,040
1.5 3,724,039
1.6 3,724,037
15 3,724,041

CLASS 29
25.42 3,724,043
26A 3,724,044
90 3,724,042
3,724,045
104 3,724,046
129.5 3,724,047
157C 3,724,048
182 3,724,050
182.1 3,725,015
182.3 3,725,016
191 3,724,049
196.6 3,725,017
200B 3,724,053
200P 3,724,052
203B 3,724,055
203D 3,724,054
204 3,724,051
253 3,724,056
416 3,724,057
417 3,724,058
426 3,724,059
427 3,724,060
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470.1 3,724,062
509 3,724,063
520 3,724,064
571 3,724,065
592 3,724,066
622 3,724,067
626 3,724,068

CLASS 30
4R 3,724,069
47 3,724,070
287 3,724,071
346.51 3,724,072
347 3,724,073

CLASS 32
14A 3,724,074
14B 3,724,075
19 3,724,099
40R 3,724,081
60 3,724,076
3,724,077

CLASS 33
1SD 3,724,079
30D 3,724,080
141E 3,724,082
177 3,724,083
185R 3,724,084
189 3,724,085
304 3,724,086
348 3,724,087

CLASS 34
16 3,724,088
23 3,724,089
57D 3,724,090
58 3,724,091
99 3,724,092
104 3,724,093
124 3,724,094
139 3,724,095
150 3,724,096

CLASS 35
6 3,724,097
10.2 3,725,563
18R 3,724,098
35C 3,724,100
35H 3,724,102
35R 3,724,101
48A 3,724,103

CLASS 36
7.3 3,724,107
14 3,724,104
44 3,724,105
3,724,106

CLASS 37
193 3,724,108

CLASS 40
22 3,724,109
28C 3,724,110
106.1 3,724,111

CLASS 42
41 3,724,112
70F 3,724,113
84 3,724,114

CLASS 43
15 3,724,115
42.06 3,724,118
42.24 3,724,116
3,724,117
42.25 3,724,119
100 3,724,120

CLASS 44
10R 3,725,018
3,725,019
50 3,725,020

CLASS 46
61 3,724,121
74D 3,724,122
78 3,724,123
97 3,724,124
119 3,724,125
220 3,724,126

CLASS 47
33 3,724,128
34 3,724,127

CLASS 49
70 3,724,129
141 3,724,130
181 3,724,131
349 3,724,133
364 3,724,132
379 3,724,134
504 3,724,135
505 3,724,136

CLASS 51
106 3,724,137
163 3,724,146
165R 3,724,138
249 3,724,139
332 3,724,140

CLASS 52
22 3,724,149
73 3,724,142
79 3,724,141
3,724,143
108 3,724,144
157 3,724,145
169 3,724,147
177 3,724,078
192 3,724,881
221 3,724,148
3,724,150
295 3,724,151
378 3,724,152
543 3,724,154
588 3,724,153
613 3,724,156
741 3,724,155
743 3,724,158
745 3,724,157

CLASS 53
3 3,724,159
3,724,168
26 3,724,160
42 3,724,161
78 3,724,162
171 3,724,163
186 3,724,185
229 3,724,164
250 3,724,165
334 3,724,166
390 3,724,167

CLASS 55
20 3,724,169
67 3,724,170
71 3,724,171
89 3,724,173
97 3,724,172
123 3,724,174
158 3,724,175
269 3,724,176
316 3,724,177
341 3,724,178
367 3,724,179
410 3,724,180
432 3,724,181

CLASS 56
10.4 3,724,182
14.3 3,724,183
51 3,724,184
202 3,724,186
361 3,724,187
400.17 3,724,188

CLASS 57
2.5 3,724,189
18 3,724,190
34HS 3,724,191
34R 3,724,192
3,724,193
75 3,724,195
77.4 3,724,196
93 3,724,197
140R 3,724,198
156 3,724,194
157S 3,724,199

CLASS 58
41R 3,724,200
50R 3,724,201
127R 3,724,202
130R 3,724,203

CLASS 59
80 3,724,204

CLASS 60
19 3,724,205
24 3,724,206
39.27 3,724,213
39.74R 3,724,207
54.6E 3,724,210
54.6P 3,724,211
73 3,724,212
3,724,214
203 3,724,215
245 3,724,216
254 3,724,217
255 3,724,219
282 3,724,218
303 3,724,220
343 3,724,208
357 3,724,209

CLASS 61
3 3,724,221
4 3,724,237
46 3,724,222
53 3,724,223
72.3 3,724,224

CLASS 62
12 3,724,225
39 3,724,226
40 3,724,227
50 3,724,228
52 3,724,229
133 3,724,230
157 3,724,231
244 3,724,232
285 3,724,233
308 3,724,234
419 3,724,236

CLASS 64
7 3,724,238
13 3,724,239

CLASS 65
3 3,725,021
27 3,725,022
72 3,725,023
114 3,725,024
134 3,725,025
156 3,725,026
158 3,725,027
182R 3,725,028

CLASS 66
50R 3,724,240
86R 3,724,241

CLASS 68
17A 3,724,242
244 3,724,243

CLASS 70
360 3,724,244
431 3,724,245
3,724,246

CLASS 71
28 3,725,029
76 3,725,030
105 3,725,031

CLASS 72
60 3,724,247
146 3,724,249
171 3,724,250
203 3,724,251
241 3,724,252
253 3,724,253
264 3,724,254
306 3,724,255
324 3,724,257
332 3,724,256
342 3,724,258

CLASS 73
10 3,724,259
12 3,724,260
67.8 3,724,262
80 3,724,263
88B 3,724,264
3,724,265
95 3,724,266
190H 3,724,267
190R 3,724,261
194EM 3,724,268
207 3,724,269
267 3,724,270
336 3,724,271
358 3,724,272
389 3,724,273
398AR 3,724,274
407R 3,724,275
422R 3,724,276
431 3,724,277
432HA 3,724,278
462 3,724,279

CLASS 74
10.33 3,724,280
10.52 3,724,281
54 3,724,282
122 3,724,248
234 3,724,284
243FC 3,724,285
492 3,724,286
493 3,724,290
526 3,724,287
572 3,724,288
711 3,724,289
815 3,724,291
863 3,724,294
864 3,724,292
866 3,724,293
3,724,295

CLASS 75
.5A 3,725,035
3,725,036
2 3,725,039
3 3,725,032
3,725,033
4 3,725,034
20F 3,725,037
60 3,725,040
3,725,041
3,725,042
72 3,725,043
74 3,725,044
93 3,725,045
101BE 3,725,046
108 3,725,047
122 3,725,048
123D 3,725,049
126 3,725,050
130.5 3,725,051
134F 3,725,054
3,725,055
134M 3,725,052
3,725,053
154 3,725,056
170 3,725,057

CLASS 81
3.3R 3,724,296
3.46A 3,724,297
63 3,724,298
128 3,724,299

CLASS 82
3 3,724,300
36 3,724,301
47R 3,724,302
59R 3,724,303

CLASS 83
3 3,724,304
14 3,724,305
210 3,724,306
337 3,724,307
435 3,724,310
557 3,724,308
575 3,724,309
590 3,724,311

CLASS 84
1.01 3,725,560
1.15 3,725,561
1.24 3,725,562
95 3,724,316
193 3,724,312
447 3,724,317
452P 3,724,313
465 3,724,314

CLASS 85
47 3,724,315

CLASS 86
1 3,724,318

CLASS 89
1M 3,724,319
1R 3,724,320
1.8 3,724,321
1.811 3,724,322
36K 3,724,324
36L 3,724,323
131 3,724,325
196 3,724,326

CLASS 90
11C 3,724,327
62R 3,724,328

CLASS 91
189 3,724,329
363A 3,724,330
391R 3,724,332
407 3,724,331
411R 3,724,333
491 3,724,334

CLASS 92
66 3,724,335
166 3,724,336
241 3,724,337
3,724,338

CLASS 93
1C 3,724,339
35R 3,724,340
3,724,341

CLASS 94
50PR 3,724,342

CLASS 95
10R 3,724,343
11L 3,724,344
3,724,346
11.5R 3,724,345
12 3,724,347
31R 3,724,348
44R 3,724,349
53E 3,724,350
3,724,351
71 3,724,352
89D 3,724,353
93 3,724,354
94R 3,724,355

CLASS 96
1.4 3,725,059
1.5 3,725,058
1.7 3,725,060
1.8 3,725,061
3 3,725,062
29D 3,725,063
35.1 3,725,064
36.1 3,725,065
49 3,725,066
55 3,725,072
56.5 3,725,067
66HD 3,725,068
75 3,725,069
87R 3,725,070
94 3,725,071
108 3,725,073
109 3,725,077
3,725,078
114.5 3,725,079

3,725,080
122 3,725,074

CLASS 98

2.11 3,724,357
2.18 3,724,358
40D 3,724,356

CLASS 99

2R 3,725,081
14 3,725,075
68 3,725,076
3,725,082
105 3,725,083
107 3,725,084
140R 3,725,085
189 3,725,086
207 3,725,087
281 3,724,359
342 3,724,360
450.6 3,724,361
516 3,724,362

CLASS 100

189 3,724,363
214 3,724,364

CLASS 101

40 3,724,365
93C 3,724,366
110 3,724,367
132.5 Re.27,613
248 3,724,368
327 3,724,369
377 3,724,370
401.1 3,724,371

CLASS 102

1R 3,724,372
4 3,724,373
7 3,724,374
31 3,724,375
38 3,724,377
42C 3,724,376
3,724,378
49.3 3,724,379
60 3,724,380
65 3,724,381
3,724,382
70.2A 3,724,383
79 3,724,384
81 3,724,385
105 3,724,386

CLASS 104

71 3,724,015
93 3,724,387
148MS 3,724,388
162 3,724,389
172B 3,724,390
172.5 3,724,391

CLASS 105

61 3,724,392
174 3,724,393
368R 3,724,394
369BA 3,724,395
378 3,724,396

CLASS 106

12 3,725,088
15FP 3,725,089
38.35 3,725,090
39.6 3,725,091
42 3,725,092
53 3,725,093
62 3,725,094
75 3,725,095
90 3,725,096
3,725,097
180 3,725,098
288B 3,725,099
3,725,100
3,725,102
288Q 3,725,101
307 3,725,103

CLASS 108

51 3,724,398
157 3,724,399

CLASS 109

53 3,724,400

CLASS 110

8R 3,724,401
72R 3,724,403

CLASS 112

158B 3,724,404
221 3,724,405
235 3,724,406
240 3,724,407
3,724,408
255 3,724,409

CLASS 114

16R 3,724,410
74T 3,724,411
90 3,724,412
220 3,724,413

CLASS 117

1.7 3,725,104
2R 3,725,105
33.5CM 3,725,106
36.7 3,725,107
37 Re.27,606
46CA 3,725,038
46CG 3,725,110
47A 3,725,108
3,725,109
54 3,725,111
75 3,725,112
82 3,725,113
93.1CD 3,725,114
93.31 3,725,115
3,725,116
100M 3,725,118
100S 3,725,117
104R 3,725,119
3,725,120
122PF 3,725,121
122P 3,725,122
126GE 3,725,123
138.8UA 3,725,124
139.5A 3,725,125
235 3,725,126

CLASS 118

1 3,724,414
2 3,724,415
7 3,724,416
24 3,724,417
69 3,724,418
119 3,724,419
505 3,724,420
630 3,724,421
637 3,724,422

CLASS 119

4 3,724,423
16 3,724,424
72 3,724,425

CLASS 122

33 3,724,426

CLASS 123

8.07 3,724,427
8.47 3,724,428
25R 3,724,429
32EA 3,724,430
3,724,431
74R 3,724,432
102 3,724,433
117R 3,724,434
139E 3,724,435
3,724,436

CLASS 124

1 3,724,437
11R 3,724,438

CLASS 125

23 3,724,439

CLASS 126

9R 3,724,440
38 3,724,441
85B 3,724,442
121 3,724,443
237 3,724,444
271.2A 3,724,445
350R 3,724,446
360R 3,724,447

CLASS 127

16 3,725,127

CLASS 128

2.06A 3,724,455
6 3,724,448
20 3,724,449
25R 3,724,450
52 3,724,451
75 3,724,452
87R 3,724,453
133 3,724,456
171 3,724,457
3,724,458
194 3,724,454
200 3,724,459
218M 3,724,460
227 3,724,461
263 3,724,462
269 3,724,463
284 3,724,464
285 3,724,465
290R 3,724,466
418 3,724,467

CLASS 131

21D 3,724,468
266 3,724,469

CLASS 132

46R 3,724,470

CLASS 134

34 3,724,471
93 3,724,472

CLASS 135

4R 3,724,473

CLASS 136

6 3,725,128
29 3,725,129
43 3,725,130
86A 3,725,131
90 3,725,132
114 3,725,133
234 3,725,134

CLASS 137

5 3,724,474
67 3,724,475
83 3,724,479
98 3,724,480
101.25 3,724,481
102 3,724,482
106 3,724,483
110 3,724,484
117 3,724,485
190 3,724,486
218 3,724,487
223 3,724,488
322 3,724,489
340 3,724,490
375 3,724,491
459 3,724,493
501 3,724,494
533.13 3,724,496
547 3,724,495
575 3,724,497
597 3,724,492
607 3,724,498
615 3,724,499
624.18 3,724,500
630.19 3,724,501
812 3,724,478
838 3,724,477
842 3,724,476

CLASS 138

41 3,724,502
45 3,724,503
46 3,724,504
92 3,724,505
96 3,724,506
122 3,724,507

CLASS 139

1 3,724,513
12 3,724,508
25 3,724,509
66R 3,724,510
3,724,511
85 3,724,512
100 3,724,514

CLASS 140

92.1 3,724,515

CLASS 141

95 3,724,516

CLASS 144

116 3,724,517
247 3,724,518

CLASS 145

33E 3,724,519

CLASS 148

1.5 3,725,135
3,725,136
6.14 3,725,138
6.2 3,725,137
6.31 3,725,139
12.1 3,725,140
16 3,725,141
3,725,142
36 3,725,143
127 3,725,144
175 3,725,145
3,725,146
183 3,725,147
186 3,725,148
3,725,149
187 3,725,150
3,725,151

CLASS 149

19 3,725,152
3,725,153
21 3,725,154
31 3,725,155
81 3,725,156
97 3,725,157

CLASS 151

41.73 3,724,520

CLASS 152

340 3,724,521

CLASS 156

14 3,725,158
3,725,159
17 3,725,160
3,725,161
53 3,725,162
64 3,725,163
73 3,725,164
123 3,725,165
143 3,725,167
148 3,725,166
157 3,725,168
184 3,725,169
217 3,725,170
230 3,725,171
250 3,725,173
252 3,725,172
305 3,725,174
327 3,725,175
330 3,725,176
333 3,725,177
393 3,725,178
448 3,725,179
515 3,725,180
519 3,725,181
527 3,725,182
563 3,725,183

CLASS 159

13A 3,724,523
13B 3,724,522

CLASS 160

24 3,724,524
28 3,724,525
368R 3,724,526
368 3,724,527
371 3,724,402

CLASS 161

6 3,725,184
53 Re.27,614
89 3,725,185
109 3,725,186
111 3,725,187
116 3,725,188
146 3,725,189
159 3,725,190
160 3,725,191
166 Re.27,610
175 3,725,192

CLASS 162

17 3,725,193
65 3,725,194
145 3,725,196
168 3,725,195
343 3,725,197

CLASS 164

58 3,724,528
154 3,724,529
252 3,724,530
361 3,724,531

CLASS 165

1 3,724,532
7 3,724,533
12 3,724,534
26 3,724,535
27 3,724,536
61 3,724,235
133 3,724,537
152 3,724,538

CLASS 166

89 3,724,539
100 3,724,540
224 3,724,541
246 3,724,542
248 3,724,543
271 3,724,544
273 3,724,545
274 3,724,546
3,724,547
275 3,724,548
282 3,724,549
285 3,724,550
295 3,724,551
304 3,724,552
3,724,553

CLASS 169

2A 3,724,554
2R 3,724,555

CLASS 172

4.5 3,724,556
197 3,724,557

CLASS 173

1 3,724,558
4 3,724,559
12 3,724,560
50 3,724,561
57 3,724,562
163 3,724,563

CLASS 174

6 3,725,564
13 3,725,565
15R 3,725,566
16B 3,725,567
38 3,725,580
3,725,581
48 3,725,568

CLASS 175

72 3,724,564
3,724,565
108 3,724,566
203 3,724,567
247 3,724,568
293 3,724,576

CLASS 176

37 3,725,198
61 3,725,199

CLASS 177

1 3,724,569
4 3,724,570
141 3,724,571
210 3,724,572
3,724,573
3,724,574
211 3,724,575

CLASS 178

5.2A 3,725,569
5.2R 3,725,570
3,725,571
5.4ST 3,725,572
6.6DD 3,725,573
6.6A 3,724,028
6.7R 3,725,574
3,725,575
6.8 3,725,576
7.3R 3,725,577
7.5R 3,725,578
22 3,725,579
58 3,725,582

CLASS 179

1HF 3,725,585
1VL 3,725,583
1C 3,725,584
1G 3,725,586
2TV 3,725,587
5R 3,725,588
6E 3,725,589
15AF 3,725,591
15BF 3,725,593
15BS 3,725,590
15.55R 3,725,592
17B 3,725,595
18AD 3,725,594
18BD 3,725,599
18EB 3,725,598
18FH 3,725,596
3,725,597
90R 3,725,602
99 3,725,600
3,725,601
100.1VC 3,725,604
100.1R 3,725,603
100.2A 3,725,611
100.2C 3,725,608
3,725,610
100.2D 3,725,607
100.2K 3,725,609
100.2P 3,725,606
100.2T 3,725,605
170.6 3,725,612
175.2R 3,725,614
175.3 3,725,613

CLASS 180

1FV 3,724,577
5R 3,724,578
3,724,579
9.2 3,724,580
9.54 3,724,397
3,724,587
24.12 3,724,581
33R 3,724,582
66R 3,724,583
79 3,724,584
79.2C 3,724,585
91 3,724,586
118 3,724,588

CLASS 181

.5BI 3,724,589
.5XC 3,724,590
53 3,724,591

CLASS 182

27 3,724,592
36 3,724,594
118 3,724,595
134 3,724,593

CLASS 184

1D 3,724,596
5 3,724,597
6.1 3,724,598
6.5 3,724,599
7D 3,724,600
56A 3,724,601

CLASS 187

8.54 3,724,602

CLASS 188

1C 3,724,603
2D 3,724,604
71.8 3,724,605
72.5 3,724,606
79.5K 3,724,607
112 3,724,608
170 3,724,609
181T 3,724,610
216 3,724,611
218XL 3,724,612
3,724,613
3,724,614
322 3,724,615
345 3,724,616

CLASS 190

16 3,724,617

CLASS 192

.07 3,724,618
18B 3,724,619
70.23 3,724,620
84C 3,724,621
105CE 3,724,622
107R 3,724,623
3,724,624
3,724,625
109F 3,724,626
110B 3,724,627

CLASS 193

35R 3,724,628
3,724,629

CLASS 195

28N 3,725,201
28R 3,725,200
66R 3,725,202
100 3,725,203
127 3,725,204

CLASS 197

19 3,724,630
49 3,724,631
85 3,724,632
151 3,724,633

CLASS 198

7BL 3,724,634
9 3,724,635
19 3,724,636
21 3,724,637
24 3,724,638
31R 3,724,639
35 3,724,640
40 3,724,641
127R 3,724,642
3,724,643
131 3,724,644
193 3,724,645
201 3,724,646
211 3,724,648
220BC 3,724,647
224 3,724,649

CLASS 200

19R 3,725,620
38FB 3,725,615
3,725,617
38R 3,725,616
46 3,725,618
3,725,621
47CZ 3,725,347
48A 3,725,619
61.27 3,725,622
148B 3,725,623
157 3,725,624
159R 3,725,625
168G 3,725,626

CLASS 202

181 3,725,205
205 3,725,206

CLASS 203

6 3,725,207
8 3,725,208
24 3,725,209
42 3,725,210
74 3,725,211

CLASS 204

1T 3,725,212
15 3,725,213
3,725,214
3,725,215
30 3,725,216
32R 3,725,217
34 3,725,218
37R 3,725,219
52R 3,725,220
61 3,725,221
67 3,725,222
99 3,725,223
141.5 3,725,224
147 3,725,225
149 3,725,226
158HA 3,725,227
159.14 3,725,228
3,725,229
3,725,231
159.2 3,725,230
180G 3,725,232
180P 3,725,233
3,725,235
181 3,725,234
195L 3,725,237
195R 3,725,236
298 3,725,238

CLASS 206

45.19 3,724,650
56AA 3,724,651
62P 3,724,652
65R 3,724,653
72 3,724,654

CLASS 208

7 3,725,240
10 3,725,239
3,725,241
46 3,725,242
59 3,725,243
3,725,244
86 3,725,245

100 3,725,246
111 3,725,247
138 3,725,248
139 3,725,249
208R 3,725,250
210 3,725,251
211 3,725,253
213 3,725,252
314 3,725,254
331 3,725,255
3,725,256
3,725,257

CLASS 209

73 3,724,655
3,724,656
74 3,724,657
143 3,724,658
238 3,724,659
250 3,724,660
437 3,724,661

CLASS 210

7 3,725,258
30 3,725,259
31C 3,725,260
38 3,725,261
42 3,725,262
3,725,263
44 3,725,264
45 3,725,265
3,725,266
48 3,725,267
53 3,725,268
59 3,725,269
63 3,725,270
65 3,725,271
83 3,724,662
85 3,724,663
104 3,724,664
130 3,724,665
169 3,724,666
195 3,724,667
331 3,724,668
409 3,724,669
448 3,724,670
484 3,724,671
500 3,724,672
3,724,673
512 3,724,674

CLASS 211

13 3,724,675
69.7 3,724,676
96 3,724,677
148 3,724,678

CLASS 212

39MS 3,724,679

CLASS 213

43 3,724,681
212 3,724,680

CLASS 214

1QG 3,724,682
2.5 3,724,683
6B 3,724,684
8.5A 3,724,686
8.5D 3,724,687
8.5R 3,724,685
16.4A 3,724,688
36 3,724,689
52C 3,724,690
3,724,691
83.36 3,724,692
138C 3,724,693
450 3,724,694
505 3,724,695
512 3,724,696
515 3,724,697
518 3,724,698
730 3,724,699

CLASS 215

46A 3,724,700

CLASS 217

65 3,724,701

CLASS 219

10.55 3,725,627
3,725,628
10.79 3,725,629
3,725,630
52 3,725,645
69G 3,725,631
116 3,725,632
121EB 3,725,633
121EM 3,725,634
121P 3,725,635
131R 3,725,636
136 3,725,637
213 3,725,638
216 3,725,639
370 3,725,640
433 3,725,641
441 3,725,642
3,725,643
494 3,725,644

CLASS 220

3.8 3,724,706
4F 3,724,702
9LG 3,724,703
26R 3,724,704
3,724,705
27 Re.27,611
44R 3,724,707
3,724,708
54 3,724,709
60R 3,724,710
63R 3,724,711
3,724,712
71 3,724,713
113 3,724,714

CLASS 221

4 3,724,715
47 3,724,716
155 3,724,717
267 3,724,718
279 3,724,719

CLASS 222

55 3,724,720
70 3,724,746
83.5 3,724,721
105 3,724,722
110 3,724,723
153 3,724,724
240 3,724,725
385 3,724,726
397 3,724,727
541 3,724,728

CLASS 223

35 3,724,729

CLASS 224

42.1D 3,724,730
42.23 3,724,731

CLASS 226

21 3,724,732
25 3,724,733
57 3,724,734
95 3,724,735
145 3,724,736
199 3,724,737

CLASS 227

147 3,724,738

CLASS 228

3 3,724,739
6 3,724,740

CLASS 229

38 3,724,741
51BP 3,724,742
55 3,724,743

CLASS 231

2E 3,724,744

CLASS 232

43.2 3,724,745

CLASS 233

3 3,724,747
21 3,724,748

CLASS 234

18 3,724,749

CLASS 235

61.11D 3,725,646
61.12R 3,725,647
92C 3,725,648
145R 3,724,750
151.1 3,725,685
151.11 3,725,651
3,725,652
3,725,654
151.12 3,725,653
151.3 3,725,650
151.32 3,725,655
151.33 3,725,656
152 3,725,684
156 3,725,649
3,725,686
164 3,725,687
176 3,725,688
181 3,725,689
183 3,725,690
186 3,725,691

CLASS 236

59 3,724,751
86 3,724,752
92C 3,724,753

CLASS 238

349 3,724,754

CLASS 239

15 3,724,755
47 3,724,756
205 3,724,757
227 Re.27,612
251 3,724,758
265.29 3,724,759
282 3,724,760
286 3,724,761
427.3 3,724,762
490 3,724,763
587 3,724,764

CLASS 240

1.3 3,725,692
3,725,693
6.4R 3,725,694
41SB 3,725,698
52R 3,725,695
84 3,725,696
93 3,725,697

CLASS 241

46.06 3,724,765
100 3,724,766
186R 3,724,767

CLASS 242

7.02 3,724,768
18DD 3,724,769
46.6 3,724,770
55.19A 3,724,771
68.3 3,724,772
107.4 3,724,773
180 3,724,774
3,724,775
195 3,724,776
3,724,777
198 3,724,778
3,724,779
206 3,724,780

CLASS 244

3.15 3,724,783
3.23 3,724,781
3.27 3,724,782
42CC 3,724,784
55 3,724,785
77G 3,724,786
110A 3,724,787
137R 3,724,788
145 3,724,789

CLASS 246

114 3,725,699

CLASS 248

4 3,724,790
42 3,724,791
205R 3,724,800
223 3,724,792
247 3,724,793
264 3,724,794
360 3,724,795
361 3,724,796
400 3,724,797
418 3,724,798
450 3,724,799

CLASS 249

48 3,724,801
67 3,724,802
102 3,724,803
128 3,724,804
171 3,724,805
219W 3,724,806

CLASS 250

41.9DS 3,725,700
43.5R 3,725,702
43.5 3,725,701
65R 3,725,703
71R 3,725,658
3,725,659
3,725,704
71.5R 3,725,657
83.3H 3,725,660
3,725,662
83.6R 3,725,661
106S 3,725,663
205 3,725,664
3,725,665
219DF 3,725,666
219DQ 3,725,667
231R 3,725,668

CLASS 251

7 3,724,807
9 3,724,818
30 3,724,808
58 3,724,809
145 3,724,810
148 3,724,811
306 3,724,812
360 3,724,813

CLASS 252

8.1 3,725,272
13 3,725,273
18 3,725,274
21 3,725,275
25 3,725,276
46.7 3,725,278
51.5A 3,725,279
51.5R 3,725,277
59 3,725,280
62 3,725,282
62.1 3,725,283
62.3GA 3,725,284
62.51 3,725,281
62.54 3,725,285
78 3,725,287
89 3,725,286
91 3,725,288
95 3,725,289
110 3,725,290
180 3,725,291
300 3,725,292
301.1R 3,725,293
3,725,294
3,725,295
3,725,296
301.4P 3,725,297
317 3,725,298
411S 3,725,299
412 3,725,300
429R 3,725,305
430 3,725,306
431R 3,725,301
3,725,302
439 3,725,303
441 3,725,304
455R 3,725,307
512 3,725,309
513 3,725,308
518 3,725,310
522 3,725,311

CLASS 254

133 3,724,814
164 3,724,816
169 3,724,815

CLASS 258

1.4 3,724,817

CLASS 259

29 3,724,819
114 3,724,820
149 3,724,821

CLASS 260

2BP 3,725,312
2N 3,725,342
2.1R 3,725,313
2.3 3,725,314
2.5AJ 3,725,316
2.5AW 3,725,319
2.5BD 3,725,318
2.5B 3,725,315
3,725,320
2.5E 3,725,317
2.5R 3,725,321
3 3,725,322
17.3 3,725,323
17.4ST 3,725,324
29.1R 3,725,325
29.3 3,725,326
29.6MM 3,725,327
29.6R 3,725,328
31.8M 3,725,332
32.8R 3,725,329
33.6AQ 3,725,330
3,725,331
38 3,725,333
3,725,334
40R 3,725,335
41R 3,725,336
45.75K 3,725,338
45.8R 3,725,337
46.5R 3,725,339
47CP 3,725,344
47EC 3,725,345
47EP 3,725,340
3,725,341
47UA 3,725,346
47C 3,725,343
58 3,725,349
67.5 3,725,350
75NH 3,725,354
75NK 3,725,353
75R 3,725,352
75S 3,725,348
3,725,351
77.5AP 3,725,355
77.5CR 3,725,356
77.5NC 3,725,357
78R 3,725,358
78.5BB 3,725,359
78.5R 3,725,360
79 3,725,362
79.5B 3,725,361
3,725,363
80.71 3,725,365
80.78 3,725,364
3,725,366
80.81 3,725,367
84.7 3,725,368
85.1 3,725,369
3,725,370
85.3R 3,725,371
88.2C 3,725,506
88.2D 3,725,372
88.7R 3,725,373
92.1 3,725,374
92.8W 3,725,375
94.2R 3,725,377
94.3 3,725,376
94.9E 3,725,379
94.9R 3,725,378
112.5 3,725,380
137 3,725,381
146D 3,725,382
146T 3,725,383
186 3,725,384
210AB 3,725,385
233.3R 3,725,386
3,725,387
239B 3,725,388
239.1 3,725,389
3,725,390
239.3A 3,725,391
239.55D 3,725,392
239.57 3,725,393
240CA 3,725,395
240F 3,725,394
240G 3,725,396
240.6 3,725,398
243C 3,725,397
3,725,399
3,725,400
243R 3,725,403
243 3,725,401
244R 3,725,402
3,725,404
247.2A 3,725,405
249.5 3,725,406
250A 3,725,407
251.5 3,725,408
268BC 3,725,410
268BZ 3,725,412
268TR 3,725,409
3,725,411
287R 3,725,413
290HL 3,725,414
292 3,725,415
293.53 3,725,419
293.58 3,725,416
293.77 3,725,417
293.86 3,725,418
294.8E 3,725,422
294.8F 3,725,420
3,725,421
295K 3,725,423
296R 3,725,424
297R 3,725,425
301 3,725,426
302R 3,725,427
305 3,725,428
309.6 3,725,429
309.7 3,725,430
310C 3,725,431
310R 3,725,432
314.5 3,725,433
326.11 3,725,436
326.3 3,725,434
326.5D 3,725,435
340.5 3,725,437
340.9 3,725,438
397.4 3,725,439
400 3,725,440
3,725,441
405 3,725,442
429K 3,725,443
3,725,444
429.7 3,725,446
429.9 3,725,445
437R 3,725,447
438.5R 3,725,448
448.8R 3,725,449
453P 3,725,450
453R 3,725,452
456A 3,725,451
463 3,725,455
465D 3,725,453
3,725,456
465.1 3,725,457
3,725,458
465.8R 3,725,459
470 3,725,460
475P 3,725,461
479R 3,725,462
3,725,463
482C 3,725,464
488R 3,725,454
501.11 3,725,465
502.4R 3,725,466
504A 3,725,467
514D 3,725,469
514G 3,725,468
519 3,725,470
521R 3,725,471
530N 3,725,472
534E 3,725,473
535P 3,725,474
544F 3,725,475
556AR 3,725,476
566A 3,725,477
570.5P 3,725,478
576 3,725,479
583EE 3,725,481
583P 3,725,480
604HF 3,725,483
604R 3,725,482
610B 3,725,484
621A 3,725,485
654D 3,725,486
659R 3,725,487
665R 3,725,488
666P 3,725,489
674N 3,725,490
679R 3,725,491
680B 3,725,492
680E 3,725,493
3,725,494
683D 3,725,496
683R 3,725,495
683.15B 3,725,498
683.15D 3,725,497
683.62 3,725,499
683.68 3,725,500
824R 3,725,501
830TW 3,725,502
857TW 3,725,503
876R 3,725,504
879 3,725,505
896 3,725,507
897C 3,725,508
899 3,725,509
927R 3,725,510
940 3,725,511
946 3,725,512
951 3,725,513
964 3,725,514
978 3,725,515

CLASS 261

43 3,724,822
69R 3,724,823
92 3,724,824
95 3,724,825

CLASS 264

3B 3,725,516
12 3,725,517
24 3,725,518
25 3,725,519
41 3,725,520
104 3,725,521
138 3,725,522
210F 3,725,523

CLASS 266

3R 3,724,826
15 3,724,827
21 3,724,828
34T 3,724,829
36P 3,724,830
38 3,724,831

CLASS 267

64R 3,724,832
140 3,724,833
159 3,724,834

CLASS 269

21 3,724,835
32 3,724,836
3,724,837

CLASS 270

79 3,724,838

CLASS 271

39 3,724,839
46 3,724,840
68 3,724,841

CLASS 272

29 3,724,842
59A 3,724,843
73 3,724,844
76 3,724,845
84 3,724,846

CLASS 273

1R 3,724,847
3,724,848
2 3,724,849
73E 3,724,850
85D 3,724,851
94R 3,724,852
98 3,724,853
101 3,724,855
101.1 3,724,854
131AB 3,724,856
145B 3,724,857

CLASS 274

4D 3,724,859
4E 3,724,858
9B 3,724,860

CLASS 277

25 3,724,861
31 3,724,862

CLASS 280

1.177 3,724,872
5.2 3,724,863
5.28 3,724,864
7.11 3,724,865
11.13C 3,724,867
11.13W 3,724,866
11.35T 3,724,868
124B 3,724,869
150AB 3,724,870
154.5R 3,724,871
203 3,724,873
408 3,724,874
457 3,724,875

CLASS 281

33 3,724,876

CLASS 285

55 3,724,877
93 3,724,878

CLASSIFICATION OF PATENTS

101 3,724,879
105 3,724,880
243 3,724,882
291 3,724,883

CLASS 287

52.08 3,724,884
58CT 3,724,885
189.36D 3,724,886
189.36 3,724,887

CLASS 292

74 3,724,888
87 3,724,889
322 3,724,890

CLASS 294

67R 3,724,891

CLASS 296

1S 3,724,892
23R 3,724,893

CLASS 297

284 3,724,894
348 3,724,895
369 3,724,896
446 3,724,897

CLASS 299

5 3,724,898
26 3,724,899
39 3,724,900
84 3,724,901

CLASS 301

5BA 3,724,904
37P 3,724,905
37R 3,724,906
105R 3,724,907

CLASS 302

37 3,724,908
52 3,724,909

CLASS 303

12 3,724,910
13 3,724,911
16 3,724,912
20 3,724,913
21BE 3,724,916
21CG 3,724,902
21F 3,724,914
3,724,915
21P 3,724,903

CLASS 307

95 3,725,669
117 3,725,670
141 Re.27,609
202 3,725,671
208 3,725,672
235R 3,725,673
237 3,725,674
238 3,725,675
255 3,725,676
260 3,725,677
264 3,725,678
268 3,725,679
3,725,680
273 3,725,681
3,725,682
305 3,725,683

CLASS 308

10G 3,724,918
72 3,724,917
238 3,724,919

CLASS 310

5 3,725,705
62 3,725,706
71 3,725,707
179 3,725,708

CLASS 312

184 3,724,920
237 3,724,921

CLASS 313

62 3,725,709
64 3,725,710
66 3,725,711
70C 3,725,712
108R 3,725,713
110 3,725,714
131 3,725,715
185 3,725,716
302 3,725,717
313 3,725,718
317 3,725,719
344 3,725,720

CLASS 315

5.43 3,725,721
21R 3,725,722
22 3,725,723
24 3,725,724
26 3,725,725
27GD 3,725,726
27TD 3,725,727
65 3,725,728
75 3,725,729
144 3,725,730
169R 3,725,731
209T 3,725,732
228 3,725,733
241P 3,725,734
249 3,725,735

CLASS 317

2F 3,725,736
3 3,725,737
3,725,738
16 3,725,739
3,725,740
18D 3,725,741
33SC 3,725,742
101CC 3,725,744
101A 3,725,743
104 3,725,745
120 3,725,746
123 3,725,747
146 3,725,748
234R 3,725,749
3,725,750
235R 3,725,751
3,725,752
3,725,753
235 3,725,754

CLASS 318

6 3,725,755
221C 3,725,757
237 3,725,756
269 3,725,758
467 3,725,759
568 3,725,760
577 3,725,761
591 3,725,762
600 3,725,763
629 3,725,764

CLASS 321

2 3,725,765
5 3,725,766
3,725,767
6 3,725,768
14 3,725,769
45R 3,725,770

CLASS 323

20 3,725,771
105 3,725,772

CLASS 324

.5AC 3,725,773
.5R 3,725,775
3,725,776
8 3,725,777
34R 3,725,778
51 3,725,779
3,725,780
83A 3,725,781

98 3,725,782
101 3,725,783
130 3,725,784
142 3,725,774
188 3,725,785

CLASS 325

15 3,725,786
58 3,725,787
469 3,725,788

CLASS 328

3 3,725,789
37 3,725,790
41 3,725,791
60 3,725,792
63 3,725,793
129 3,725,794
135 3,725,795
163 3,725,796
228 3,725,797

CLASS 330

4 3,725,798
21 3,725,799
29 3,725,800
30D 3,725,801
31 3,725,802
46 3,725,803
69 3,725,804
124D 3,725,818
136 3,725,805
149 3,725,806
185 3,725,807

CLASS 331

65 3,725,808
94.5 3,725,809
3,725,810
3,725,811
3,725,812
3,725,813
3,725,814
3,725,815
3,725,816
3,725,817
107G 3,725,821
107R 3,725,820
107S 3,725,819
108B 3,725,822

CLASS 333

1.1 3,725,823
21R 3,725,824
30R 3,725,826
30 3,725,827
71 3,725,828
79 3,725,825
84M 3,725,829

CLASS 335

32 3,725,830
212 3,725,831

CLASS 336

96 3,725,832
146 3,725,833

CLASS 337

44 3,725,834
140 3,725,835

CLASS 338

21 3,725,836
28 3,725,837
174 3,725,838
334 3,725,839

CLASS 339

14R 3,725,840
3,725,841
17CF 3,725,842
19 3,725,843
49R 3,725,844
3,725,845
61M 3,725,847

61R 3,725,846
62 3,725,848
92R 3,725,849
3,725,850
198J 3,725,852
198N 3,725,851
252R 3,725,853

CLASS 340

1R 3,725,854
6R 3,725,855
8R 3,725,856
18CM 3,725,857
53 3,725,858
146.1AL 3,725,859
146.1AX 3,725,860
146.1F 3,725,861
146.3H 3,725,862
166R 3,725,863
172 3,725,865
172.5 3,725,864
3,725,866
3,725,867
3,725,868
3,725,869
3,725,870
3,725,871
3,725,872
3,725,873
3,725,874
3,725,875
3,725,876
3,725,877
173AM 3,725,879
173FF 3,725,878
3,725,881
173RC 3,725,880
174M 3,725,882
174.1C 3,725,883
174.1E 3,725,884
174.1H 3,725,885
224 3,725,886
3,725,887
258A 3,725,888
259 3,725,889
262 3,725,890
273 3,725,891
274 3,725,892
280R 3,725,894
280 3,725,893
3,725,895
282 3,725,896
324A 3,725,897
3,725,900
3,725,901
324M 3,725,899
324 3,725,898
347AD 3,725,903
3,725,905
347P 3,725,902
3,725,904
365A 3,725,907
3,725,908
365 3,725,906
373R 3,725,909
378R 3,725,910
415 3,725,911

CLASS 343

5DP 3,725,916
5EM 3,725,918
5PC 3,725,912
3,725,915
5SA 3,725,917
3,725,928
5SM 3,725,913
5W 3,725,914
6.5R 3,725,919
3,725,920
7ED 3,725,921
7A 3,725,922
7.7 3,725,923

10 3,725,924
17.1R 3,725,925
17.5 3,725,926
18E 3,725,927
100ME 3,725,930
3,725,931
105R 3,725,932
106R 3,725,933
112CA 3,725,934
114.5 3,725,935
119 3,725,936
120 3,725,937
3,725,938
225 3,725,939
708 3,725,941
713 3,725,940
715 3,725,942
797 3,725,943
844 3,725,929
873 3,725,944
882 3,725,945
912 3,725,946

CLASS 346

33R 3,725,947
72 3,725,949
74ES 3,725,950
3,725,951
77 3,725,948
82 3,725,952

CLASS 350

96R 3,724,922
160LC 3,724,925
160R 3,724,926
167 3,724,924
203 3,724,927
289 3,724,928
312 3,724,929
320 3,724,930

CLASS 351

1 3,724,931
7 3,724,932
36 3,724,933
44 3,724,934

CLASS 352

38 3,724,935
91 3,724,936
140 3,724,937

CLASS 353

20 3,724,938

CLASS 355

3R 3,724,940
3 3,724,939
3,724,941
3,724,942
4 3,724,943
18 3,724,944
29 3,724,945
36 3,724,946
38 3,724,947
55 3,724,948
75 3,724,949

CLASS 356

3 3,724,950
102 3,724,951
114 3,724,952
116 3,724,957
153 3,724,953
158 3,724,923
160 3,724,958
170 3,724,959
175 3,724,954
227 3,724,955
246 3,724,956

CLASS 401

67 3,724,960
110 3,724,961
223 3,724,962

CLASS 408

14 3,724,963
3,724,964
183 3,724,965

CLASS 415

1 3,724,966
168 3,724,967
181 3,724,968
190 3,724,969

CLASS 416

27 3,724,970
227 3,724,971

CLASS 417

220 3,724,972
326 3,724,973
477 3,724,974

CLASS 418

10 3,724,975

CLASS 423

49 3,725,524
112 3,725,528
139 3,725,527
210 3,725,530
223 3,725,529
244 3,725,531
245 3,725,532
290 Re.27,608
291 3,725,533
417 3,725,534
419 3,725,535
449 3,725,538
485 3,725,536
575 3,725,537
598 3,725,539
613 3,725,526

CLASS 424

46 3,725,540
61 3,725,525
80 3,725,541
89 3,725,542
114 3,725,543
154 3,725,544
180 3,725,545
225 3,725,546
251 3,725,557
273 3,725,549
3,725,554
274 3,725,550
282 3,725,551
301 3,725,555
303 3,725,548
315 3,725,553
330 3,725,552
357 3,725,556

CLASS 425

72 3,724,976
3,724,977
86 3,724,978
88 3,724,979
102 3,724,980
109 3,724,981
117 3,724,982
129 3,724,983
131 3,724,984
132 3,724,985
154 3,724,986
326 3,724,987
348 3,724,988
388 3,724,989
450 Re.27,607

CLASS 431

93 3,724,990
3,724,991
154 3,724,992
255 3,724,993
328 3,724,994
352 3,724,995

CLASS 432

264 3,724,996

CLASSIFICATION OF DESIGNS

D 1— 26 226,595
D 2— 232 226,596
226,597
247 226,598
D 6— 20 226,599
226,600
201 226,601
D 8— 191 226,602

D11— 1 226,603
D14— 6 226,604
D23— 19 226,605
49 226,606
55 226,607
146 226,608
153 226,609
D25— 1 226,610

D26— 5 226,611
14 226,612
D29— 23 226,613
226,614
226,615
D34— 5 226,616
226,617
15 226,618

226,619
D40— 1 226,620
D41— 226,621
D42— 7 226,631
D44— 15 226,622
21 226,623
D45— 16 226,624
D48— 226,625

20 226,626
D49— 21 226,627
30 226,628
35 226,629
226,630
D52— 4 226,632
D67— 34 226,638
D71— 1 226,633

226,634
D83— 226,635
D86— 10 226,636
D87— 3 226,637
D88— 226,639
D90— 8 226,640
20 226,641
D95— 3 226,642

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

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96— 1.6 T909,009

99— 90CB T909,005
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161— 107 T909,008
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260— 5 T909,006
340.9 T909,012

555 T909,003
264— 56 T909,004

95 T909,007
350— 162SF T909,010

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama 1
Alaska 2
American Samoa 3
Arizona 4
Arkansas 5
California 6
Canal Zone 7
Colorado 8
Connecticut 9
Delaware 10
District of Columbia 11
Florida 12
Georgia 13
Guam 14
Hawaii 15
Idaho 16
Illinois 17
Indiana 18
Iowa 19
Kansas 20
Kentucky 21
Louisiana 22
Maine 23
Maryland 24
Massachusetts 25
Michigan 26
Minnesota 27
Mississippi 28
Missouri 29
Montana 30
Nebraska 31
Nevada 32
New Hampshire 33
New Jersey 34
New Mexico 35
New York 36
North Carolina 37
North Dakota 38
Ohio 39
Oklahoma 40
Oregon 41
Pennsylvania 42
Puerto Rico 43
Rhode Island 44
South Carolina 45
South Dakota 46
Tennessee 47
Texas 48
Utah 49
Vermont 50
Virginia 51
Virgin Islands 52
Washington 53
West Virginia 54
Wisconsin 55
Wyoming 56
U.S. Air Force 57
U.S. Army 58
U.S. Navy 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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Re.27,608
1 : 3,724,149
3,724,418
3,725,804
3,725,911
2 : 3,725,182
3,725,496
4 : 3,724,409
3,724,591
3,724,846
3,725,150
3,725,151
3,725,442
3,725,673
3,725,681
3,725,787
3,725,938
6 : 3,723,996
3,723,997
3,724,000
3,724,008
3,724,018
3,724,048
3,724,053
3,724,067
3,724,076
3,724,077
3,724,082
3,724,083
3,724,099
3,724,103
3,724,106
3,724,119
3,724,121
3,724,122
3,724,125
3,724,129
3,724,130
3,724,134
3,724,135
3,724,145
3,724,157
3,724,168
3,724,178
3,724,185
3,724,193
3,724,216
3,724,246
3,724,251
3,724,263
3,724,276

3,724,281
3,724,296
3,724,298
3,724,309
3,724,322
3,724,323
3,724,330
3,724,342
3,724,343
3,724,356
3,724,360
3,724,373
3,724,383
3,724,429
3,724,442
3,724,456
3,724,458
3,724,459
3,724,463
3,724,466
3,724,485
3,724,487
3,724,488
3,724,495
3,724,499
3,724,501
3,724,503
3,724,516
3,724,535
3,724,546
3,724,554
3,724,580
3,724,581
3,724,582
3,724,590
3,724,593
3,724,636
3,724,644
3,724,652
3,724,666
3,724,677
3,724,684
3,724,699
3,724,725
3,724,748
3,724,757
3,724,758
3,724,759
3,724,764
3,724,765
3,724,768

3,724,771
3,724,772
3,724,783
3,724,798
3,724,803
3,724,818
3,724,834
3,724,847
3,724,849
3,724,850
3,724,860
3,724,867
3,724,878
3,724,896
3,724,900
3,724,905
3,724,916
3,724,917
3,724,923
3,724,932
3,724,938
3,724,956
3,724,963
3,724,973
3,725,004
3,725,005
3,725,010
3,725,020
3,725,085
3,725,086
3,725,089
3,725,092
3,725,110
3,725,117
3,725,173
3,725,175
3,725,209
3,725,215
3,725,224
3,725,237
3,725,239
3,725,243
3,725,244
3,725,251
3,725,259
3,725,261
3,725,264
3,725,270
3,725,275
3,725,282
3,725,346

3,725,406
3,725,421
3,725,425
3,725,467
3,725,516
3,725,531
3,725,564
3,725,568
3,725,576
3,725,580
3,725,581
3,725,589
3,725,603
3,725,611
3,725,622
3,725,628
3,725,646
3,725,658
3,725,665
3,725,671
3,725,677
3,725,682
3,725,686
3,725,689
3,725,700
3,725,701
3,725,704
3,725,709
3,725,714
3,725,719
3,725,721
3,725,729
3,725,747
3,725,764
3,725,765
3,725,767
3,725,773
3,725,782
3,725,816
3,725,828
3,725,829
3,725,838
3,725,845
3,725,848
3,725,861
3,725,872
3,725,873
3,725,876
3,725,878
3,725,881
3,725,883

3,725,884
3,725,886
3,725,905
3,725,910
3,725,913
3,725,915
3,725,922
3,725,930
3,725,931
3,725,935
3,725,941
3,725,947
3,725,950
8 : 3,724,142
3,724,279
3,724,301
3,724,317
3,724,472
3,724,545
3,724,661
3,724,842
3,724,872
3,725,557
3,725,596
3,725,598
3,725,606
3,725,655
3,725,744
3,725,864
3,725,865
3,725,885
9 : 3,724,064
3,724,140
3,724,226
3,724,347
3,724,366
3,724,368
3,724,372
3,724,376
3,724,382
3,724,400
3,724,531
3,724,637
3,724,733
3,724,786
3,724,986
3,725,099
3,725,108
3,725,111
3,725,138
3,725,184

3,725,199
3,725,204
3,725,307
3,725,312
3,725,327
3,725,354
3,725,417
3,725,527
3,725,530
3,725,575
3,725,624
3,725,627
3,725,640
3,725,726
3,725,733
3,725,741
3,725,902
10 : 3,724,068
3,724,198
3,724,650
3,724,712
3,724,756
3,725,035
3,725,095
3,725,157
3,725,310
3,725,343
3,725,448
3,725,532
11 : 3,723,994
3,725,856
12 : 3,723,998
3,724,012
3,724,062
3,724,120
3,724,199
3,724,379
3,724,423
3,724,427
3,724,437
3,724,451
3,724,455
3,724,595
3,724,715
3,724,760
3,724,791
3,724,929
3,724,933
3,724,952
3,724,954
3,725,083

3,725,119
3,725,154
3,725,156
3,725,582
3,725,855
13 : 3,724,029
3,724,032
3,724,189
3,724,195
3,724,307
3,724,443
3,724,690
3,724,691
3,724,808
3,725,263
15 : 3,724,745
16 : 3,724,634
3,724,799
3,724,841
3,725,659
3,725,688
3,725,940
17 : Re.27,609
Re.27,611
3,724,010
3,724,084
3,724,095
3,724,114
3,724,126
3,724,173
3,724,186
3,724,204
3,724,205
3,724,227
3,724,229
3,724,248
3,724,280
3,724,289
3,724,313
3,724,315
3,724,395
3,724,396
3,724,398
3,724,399
3,724,412
3,724,441
3,724,454
3,724,461
3,724,474
3,724,533
3,724,547
3,724,574
3,724,665
3,724,679
3,724,716
3,724,727
3,724,738
3,724,763
3,724,775
3,724,779
3,724,806
3,724,848
3,724,899
3,724,920
3,724,927
3,725,114
3,725,121
3,725,202
3,725,248
3,725,249
3,725,252
3,725,290
3,725,303
3,725,304
3,725,306
3,725,323
3,725,373
3,725,385
3,725,386
3,725,424
3,725,512
3,725,583
3,725,599
3,725,600
3,725,608
3,725,614
3,725,616
3,725,626
3,725,644
3,725,657
3,725,664
3,725,668
3,725,674
3,725,683
3,725,739
3,725,740
3,725,759
3,725,783
3,725,788
3,725,790
3,725,793
3,725,832
3,725,850
3,725,851
3,725,863
3,725,933

18 : 3,724,075
3,724,207
3,724,209
3,724,211
3,724,332
3,724,365
3,724,375
3,724,385
3,724,515
3,724,524
3,724,611
3,724,614
3,724,616
3,724,681
3,724,724
3,724,816
3,724,830
3,724,889
3,724,909
3,724,910
3,724,922
3,724,972
3,724,989
3,725,003
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DESIGN PATENTS

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U. S. GOVERNMENT PRINTING OFFICE : O - 1973

U. S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary

PATENT OFFICE
Robert Gottschalk, Commissioner